```
Maple 9.5.1> int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);
             int(z-z+z^2+z^3, z=0..1);

              7/12
              7/6
              7/12
              7/6
              7/12
              7/6
              7/12
              7/6
              7/12
              7/6
              7/12
              7/6
```

```
Maple 9.5.1 > limit(sin(z)^2+cos(z)^2, z=infinity);
               0 .. 2

Maple 9.5.1 > int((1+z)^z, z);
               z*hypergeom([1, -z],[2],-z)

Maple 9.5.1 > sum(1/n, n= -infinity..-2);
  Error, (in cot) numeric exception: division by zero

Maple 9.5.1 > evalf(Int(exp(z), z= 0..707));
              Float(infinity)

Maple 9.5.1 > maximize(tan(z)^2), z= 0..1);
              f

Maple 9.5.1 > evalf(Sum(1, n= 1..infinity));
               0.

Maple 9.5.1 > evalf(EllipticE(I,I));
  Error, (in evalf/Elliptic/E_M) invalid input: expected
  evalf[]index to be of type posint but received 22+Dm

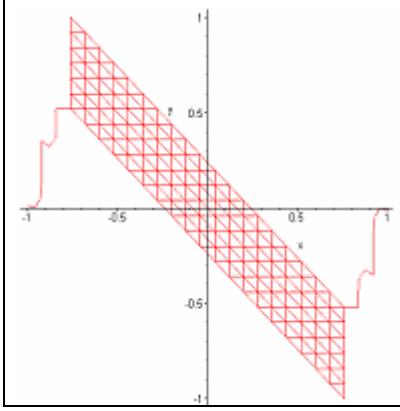
Maple 9.5.1 > evalf(MeijerG([[0], []],[[0], []],0));
   Error, (in ln) numeric exception: division by zero
```

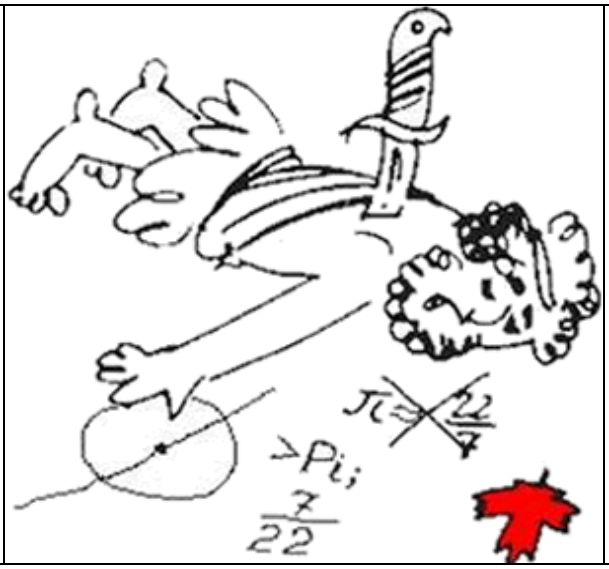
Man+Machine Review Of Maple Crisis: 1993-2004. Part I

Failing to deliver an environment of quality, Maplesoft has brought its customers in a sad plight. Can this be fixed?

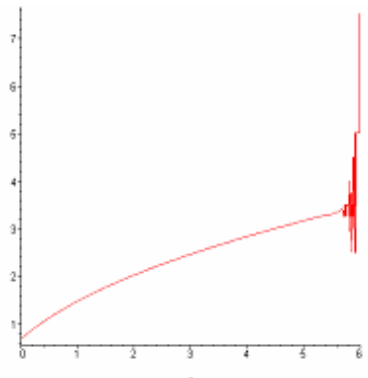
© 2004 Vladimir Bondarenko www.cybertester.com

```
Maple 9.5.1 > with(plots):
implicitplot(x^111/(x+y)^17=1
, x=-1..1, y=-1..1);
```






```
Maple 9.5.1 > plot(HermiteH(1/2,
              z), z=0..6);
```



Main Maple's Quality Results

1. Maple 9.5 is an **unstable, inconsistent, non-linear, non-uniform, randomized, self-incompatible** environment where fundamental math properties (uniqueness of the answer for a good-defined problem commutativity & linearity property etc) now hold, now fail making Maple breaking down grotesquely.
2. Surprisingly, success achieved by Waterloo Maple/Maplesoft came rather by chance than by planning.
3. Up to this time, a ridiculously low fraction of Maple bugs, **2-3% at best**, has been reported ever publicly.
4. Waterloo Maple/Maplesoft does not fix **publicly** known bugs (e.g. in residue) since 1989, for 15 years (!)
5. Systematically, **to fix a bug for Maplesoft means only to return the input unevaluated, suppress a wrong answer instead of providing a correct one.** This cannot be considered as a true fixing approach.
6. Officially introduced features, systematically, do NOT work as it is stated in the Help. Also, Maple is raw, it often cannot follow the given task to its logical end.
7. In the version x+1 Maplesoft *invariably* breaks tangibly the functionality that works well in the version x.
8. There exists something like the swing of the tides in the propagation of Maple bugs over versions.
9. Maple 9.03/9.02/9.01/9 are in fact beta release candidates sold by Maplesoft under the statement that they are and at the price of regular commercial releases.
10. There are **at least thousands** regression bugs in Maple.
11. There are **at least hundreds** recurring regression bugs in Maple.
12. Reproducible instability exists in Maple at least since 1994.
13. Since Maple 8, Maple is getting more and more instable reproducibly.
14. There is irreproducible documented/recorded instability.
15. The found solutions are often partial; that is to say, unlike its competitors, Maple fails to find all solutions.
16. Maple cannot use its own resources efficiently.
17. Maple uses obsolete, inefficient algorithms.
18. Command line and the GUI versions produce *different mathematical results* since at least 1997.
19. Maple bugs are ubiquitous; the customer can encounter a bug even in 'simple' functions: / (division), type(), define(), whattype(), print(), printf(), lprint(), version(), cpulimit(), expand(), euler(), plot(), DEplot(), subs(), residue(), pade(), densityplot(), ellipse(), inequal(), coeff(), coeffs(), convert(), changevar(), eliminate(), combinat(), charpoly(), contourplot() etc
20. There are thousands undocumented features, according to Maple experts.
21. Maple makers do not know how to or in any case do not want to use a spellchecker.
22. Summing up, since some 2002, Maple is becoming more and more user-hostile.
23. Maplesoft quality assurance group's activity is blocked or inadequate, in any case, it is inefficient.
24. Maplesoft is increasingly loosing control over Maple development.
25. There are lasting severe decision making problems in the top Maplesoft's management staff.
26. During the last decade, a user-centered Maple development model evolved gradually into a revenue-centered Maple development model, which represents a direct threat to the very existence of Maplesoft.
27. If immediate actions are not taken, Maplesoft is running a risk of loosing its market share increasingly.

Caveat

The stuff you are reading relates to the final version of this Review like Michelangelo's study does to the David.

Thus, if you look for an impressive document, please stop reading, and wait for the final version of the Review to be released in about 10 months.

CONTENT

Abstract

Once a famous Hellenic hero did a favor to a local community via certain actions with a specific type of buildings over there. In view of the Hardware Software Conflict http://www.cybertester.com/problem.php , someone must proceed along this track, — let it be us who begin, at the Maple case study.

We have reviewed the 22 years long attempt to produce a powerful symbolic-numeric industry-oriented environment, Maple, the lessons it teaches us as well as the status quo and the future of this effort.

We present the 1st world's publicly available professional investigation of the Maple computer algebra system quality assurance issues based upon 1,500,000+ test cases and 5.5+ Gb of Maple bug-related logs, produced by our automated bug identification machines, GEMM http://www.CAS-testing.org/ and VM.

Trying to predict the Maple's future and the customer's prospects, we consider evolution of Maple quality and Maple bugs propagation along the versions over the last decade, 1993-2004.

3 types of Maple's quality decay are exposed. New types of defects in Maple are described. Recurring regression bugs are discovered. Instability propagation along Maple versions are explored. Quality-version diagrams are given.

Maple myths, reasons for their occurrence have been conjectured, and their propagations have been studied.

A set of ideas to meet the Maplesoft crisis and to narrow the credibility gap is proposed.

Our main technical results to be deployed in this memoir boil down to following statements; we give the reader 1024 most frustrating Maple bug manifestations to support our conclusions. The overwhelming majority of the bug manifestations quoted here are not published elsewhere except our definitive Maple Bugs Encyclopaedia http://maple.bug-list.org .

Key Words

User's quality viewpoint, Maple bugs, bug taxonomy, bug history, bug signature, bug severity, bug life cycle, bug list, failure prediction, bug fixing cost, black box testing, propagation of Maple bugs, bug manifestation pattern, average fix time, automated testing system, automated AI driven testing, test oracle, behaviour simulator, automated bug sample minimization, automated bug classification, gates, neuron network, symbolic computation, validation, verification, user driven quality control, quality assurance, quality control, software development, quality assurance overheads cost reduction, developer's version, network, cluster, build, remote automated testing, parallel automated testing, distributed automated testing, computer algebra future.

Being involved in several other projects, we propose to your attention at least a small fraction of our initial analysis right away; the rest, some 80%, is coming within the next months.

So, with this Review we are starting the promised Maple Bug *tour de force*. Maple bugs carnival is called to order. Up we go!

Keith Geddes

Gaston Gonnet

The old good 1989… Free bug fixes, complete support services… then the customer did **not** pay for bug fixing.

Download full description

Software Product Description

PRODUCT NAME: Maple, Version 4.3V SPD 34.63.01

[…]

ORDERING INFORMATION

Software License, Media and Documentation:
QB-GN8A9-VA

SOFTWARE LICENSING

This software is furnished under the licensing provisions of Digital Equipment Corporation's Standard Terms and Conditions. For more information about Digital's licensing terms and policies, contact your local Digital office.

SOFTWARE PRODUCT SERVICES

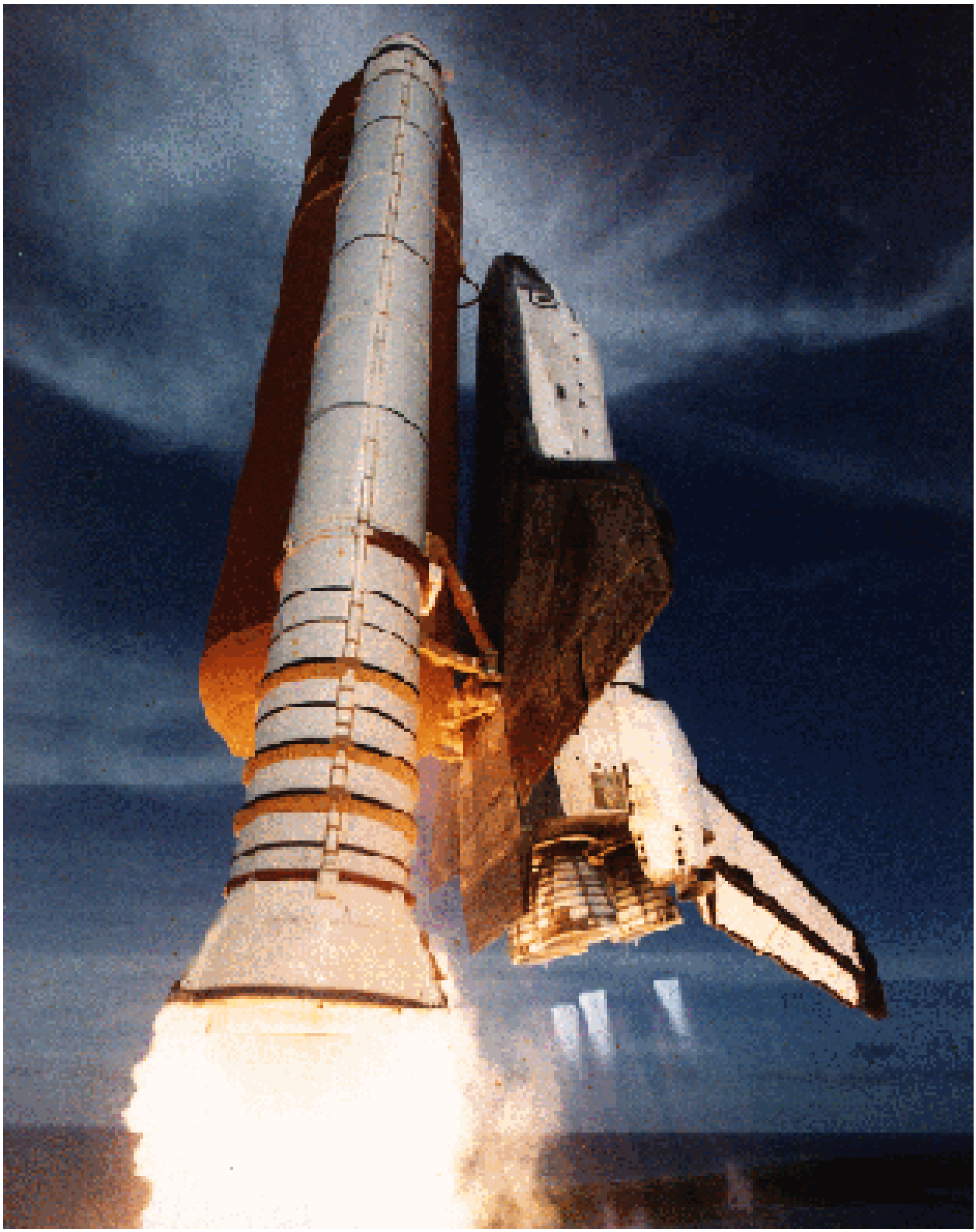
Software Product Services are supplied by Waterloo Maple Software for one year, commencing with the shipment of the software.

Waterloo Maple Software provides complete support services. The license fee includes one year of maintenance, support and the following:

• Bug fixes

• Updates and new versions of the software released within the one year

1988: Concordia cum veritate



Motivation

According to NIST, economical losses 59.5 billion annually

In 1989, there were dozens of thousands Maple users. In 2004, according to Maplesoft data

http://www.maplesoft.com/pressroom/releases/2004/2004-11-02.shtml

'Over 5 million users benefit from advanced Maple technology.'

Thus, for the last 20 years, the number of Maple users has grown dramatically. One could expect that Maple's quality would grow over these 20 years, too.

However, reading the users' comments on Maple quality placed in public domain leaves a lasting impression that there is a big problem with Maple quality, and it arose not yesterday. As for now, it seems that praiseful words on Maple can be found on Maplesoft's site mostly which affront the ear. Even more, over 2 last years, none of Maplesoft officials commented the sad Maple 9 events and proposed to the Maple customers a prospect of amendment. The absolute silence on Maplesoft part reminds much the following

> I cannot imagine any condition which would cause a ship to founder.
>
> — Edward J. Smith, captain of the Titanic

> You'd have to wait 100,000 years before the Chernobyl reactor had a serious accident.
>
> — Soviet deputy minister of the power industry

> The probability risk assessment for the loss of a shuttle... one in ten thousand.
>
> — Bryan O'Connor, director of the shuttle program

The common feature with all 3 cases is that no systematic quality research has been produced in each above-quoted case, and it was the absence of stability investigation that made the corresponding disasters especially sinistrous, both from personal and economic viewpoint.

Surprisingly, searching over the Internet shows that, up to now, no systematic research upon evolution of Maple quality has been produced. This resulted in emergence of a kind of misleading Maple-related mythology based more on emotions rather than the facts.

To bridge the gap, in the immediate future we are going to propose our readers a beta version of fact-founded Maple evolution review.

.....

Return-Path: <vvb@mail.strace.net>
Date: Tue, 14 May 2002 03:43:41 +0400
From: Vladimir Bondarenko <vvb@mail.strace.net>
X-Mailer: The Bat! (v1.44)
Reply-To: Vladimir Bondarenko <vvb@mail.strace.net>
X-Priority: 3 (Normal)
Message-ID: <735961953.20020514034341@mail.strace.net>
X-Confirm-Reading-To: Vladimir Bondarenko <vvb@mail.strace.net>
Return-Receipt-To: Vladimir Bondarenko <vvb@mail.strace.net>
To: lbernardin@maplesoft.com
Subject: Re: Technology for Maple testing
Mime-Version: 1.0
Content-Type: multipart/mixed; boundary="----------6FEC13FFBEA52D"

----------6FEC13FFBEA52D
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

Dear Laurent Bernardin,

It was really nice to get a reply from you, thanks.

LB> First, I must apologize for taking as much time to get back to you.

Maybe, it is me who must apologize for writing to you at so hot time. Actually, you are on the eve of the official release. And, still, you have found the time to reply me. I contacted you because I hope that I could help Waterloo Maple Inc. make your Maple even stronger and more attractive for the customers.

LB> we strive to increase Maple's quality on an ongoing basis and
LB> your applying your methodology at this point might allow us
LB> more time to fix arising problems for a future release.

Hopefully, it is the case.

LB> May I ask for a little more detail on your method?

Sure. In a single sentence, I emulate working of the users having various experience, from beginner to expert level, and analyze the corresponding output using the system and my own (sometimes, rather sophisticated) procedures.

The approach is split into 3 parts:

* automated black box testing (hundreds mathematical functions, including int, limit, series, sum, product, and much more)

* additional manual black box testing (plotting and documentation). Right this day, I still have no satisfactory approach to automated plotting testing, but I keep working on this problem

* white box testing (I read carefully the source code, and try to find the suspicious lines and analyze them)

A. Automated testing starts from a precomputed database # 1 of several thousand entries involving severaldozen most common mathematical functions. In military terms, record adjustment. It is here where I make a choice of the further testing strategy.

B. Secondly, 800+ heuristics and 100+ metaheuristics direct the further processing. In particular, the monitor tries, if possible, to identify the minimal (in a sense) form which still causes the concrete problem.

Step by step, I add manually the new heuristics to the database # 2. In the future, though it is not a very trivial task, I hope to generate these new heuristics automatically.

In Mathematica, I also intercept the system messages, and by analyzing them can efficiently identify new problems.

C. At last, I am in the process of scanning and converting of several selected problem books and handbooks into the proper form, so later I can use this stuff (DB #3) to reinforce the approach.

All wrong and suspicious outputs are added to the database # 4.

I had implemented a part of such an approach in the Mathematica language.

In the attached file Sample02.nb, please ignore the messages in green, they are a kind of my internal debugging information.

The Mathematica's bugs in red look somewhat messy, because

* I still did not implement the automatic computation of the 'minimal' form, for the given bug

* I did not sort the bugs automatically in a sequence which was the easiest to read by human (e.g., thematically)

* The general outlay should be improved, too.

These points are quite manageable, I am working on that.

About the performance. In the shown file, 425 unique bug manifestations were identified in 22 hours, on an Athlon XP 1600+/512 Mb RAM based machine. It is rather typical. Some of these problems, as I suspect, might be not "linearly independent".

LB> In particular, can you give a few examples of the types of problems
LB> your method has uncovered in the past, either in Maple or in a
LB> competitor's product?

I have applied this approach to Derive, Mathematica and MuPAD.

The attached notebooks file Sample02.nb demonstrates how approximately it looks THIS moment.

MathReader is a free application for viewing Mathematica notebooks. You can download it at www.wolfram.com/mathreader .

The file Sample01.txt gives more examples as well as demonstrates
the types of the problems which I can identify with the help of the technology.

The second competitor is MuPAD by SciFace Software GmbH. Using the following authorization

username: "vvb"
password: "wl2hfy"

you may wish to find out the information on MuPAD 2.5 beta testing

http://www.mupad.de/site/bt25/contest/bug_query_beta.shtml

You can ask Bugzilla to show the problems identified by myself.

Here is the official estimation of my work

http://www.mupad.de/site/bt25/contest/winner.shtml

With MuPAD, I, in fact, used the same technology, but I was proposed to participate in the beta testing all of a sudden, and, being busy with the other projects, simply had not enough time to implement the full-fledged monitor in the MuPAD language. Instead, I only used a couple of simple procedures based on the same ideas.

I would hope, this, so-to-say, large-scale computational approach, that is running Maple around the clock would almost certainly reveal soon more than one new problem (as it was with Mathematica).

I have learnt about the existence of Maple in 1992, at Glushkov Institute of Cybernetics (Kiev) during a seminar lead by Prof Letichevsky. Since then, my (pleasant) experience with Maple has convinced myself that your symbolic computer algebra system is rather reliable - and could be improved, too. The Maple users might like these improvements.

Once, during ISSAC'94 in Oxford I showed to Michael Monagan a couple of examples. In fact, I used that time a very very weak version of the technology I am pleased to propose you to focus the efforts of your team on the actual research and coding.

At last, I am in the process of exploring a new layer of ideas, which, I hope, will at least double the performance of the technology on the same resource. I expect that I will finish this preliminary investigation within 6 months, and report you the details of my experimenting. As far as I know, possibly, nobody has tried this somewhat unusual path.

Naturally, I realize that you have an enviable computational experience. That is why it would be extremely interesting to hear any comments from you.

Let me thank you cordially for your interest in my ideas. If you have any kind of questions, please feel absolutely comfortable to let me know about it.

Best regards,

Vladimir Bondarenko

Applied mathematician
Email: vvb@mail.strace.net
Voice: (380)-652-447325
76 Zalesskaya St., Apt 29.
Simferopol
Crimea 95044
Ukraine

.....

As I'd learnt from McNamara, the discipline of writing something down is the first step toward making it happen. In conversation, you can get away with all kinds of vagueness and nonsense, ofter without even realizing it. But there's something about putting your thoughts on paper that forces you to get down to specifics. That way, it's harder to deceive yourself - or anybody else.

Lee Iacocca
An Autobiography

.....

Return-Path: <lbernardin@maplesoft.com>
Received: from ns.maplesoft.on.ca (ns.maplesoft.on.ca [205.211.164.226]) by strace.net (8.10.2/8.10.2) with SMTP id g4GIrT012360 for <vvb@mail.strace.net>; Thu, 16 May 2002 21:53:31 +0300
Received: from vega.maplesoft.on.ca by ns.maplesoft.on.ca via smtpd (for strace.net [212.35.162.132]) with SMTP; 16 May 2002 18:53:28 UT
Received: from courier.maplesoft.on.ca (courier [192.139.233.111]) by vega.maplesoft.on.ca (8.11.6/8.11.6) with ESMTP id g4GIrIJ19943 for <vvb@mail.strace.net>; Thu, 16 May 2002 14:53:18 -0400 (EDT)
Received: by courier.maplesoft.on.ca with Internet Mail Service (5.5.2653.19) id <GLK69S7B>; Thu, 16 May 2002 14:53:18 -0400
Message-ID: <F17255C2B596D3119A5600508B44FA6802C36A90@courier.maplesoft.on.ca>
From: Laurent Bernardin <lbernardin@maplesoft.com>
To: "'Vladimir Bondarenko'" <vvb@mail.strace.net>
Subject: RE: Technology for Maple testing
Date: Thu, 16 May 2002 14:53:17 -0400
MIME-Version: 1.0
X-Mailer: Internet Mail Service (5.5.2653.19)
Content-Type: text/plain; charset="iso-8859-1"
X-UIDL: KI;!!X`*!!!f%!!d1l"!

Dear Vladimir,

What you propose sounds very interesting, indeed. It sounds like your ethodology could be applied step by step, where each step will reveal new seful information. If we would supply you with a copy of Maple 7, what kind of a time line and fee structure do you envision for parts 1, 2 and 3?

If you want, we could also set up a phone call to discuss this in more detail.

best regards

-Laurent

.....

Return-Path: <vvb@mail.strace.net>
Date: Mon, 20 May 2002 15:42:04 +0400
From: Vladimir Bondarenko <vvb@mail.strace.net>
X-Mailer: The Bat! (v1.44)
Reply-To: Vladimir Bondarenko <vvb@mail.strace.net>
X-Priority: 3 (Normal)
Message-ID: <17126519068.20020520154204@mail.strace.net>
X-Confirm-Reading-To: Vladimir Bondarenko <vvb@mail.strace.net>
Return-Receipt-To: Vladimir Bondarenko <vvb@mail.strace.net>
To: lbernardin@maplesoft.com
Subject: Fee
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

Dear Laurent,

You write:

LB> what kind of a time line and fee structure do you envision
LB> for parts 1, 2 and 3?

What do you make of the fixed rate of CAD 825 / USD 550 a week
for each step (my local taxes are already included)?

Hoping to hear from you soon.

Best regards,

Vladimir

.....

Return-Path: <lbernardin@maplesoft.com>
Received: (from root@localhost) by strace.net (8.10.2/8.10.2) id g55DXZ402915 for vvb@mail.strace.net. ROCMAIL; Wed, 5 Jun 2002 16:33:35 +0300
Received: from ns.maplesoft.on.ca (ns.maplesoft.on.ca [205.211.164.226]) by strace.net (8.10.2/8.10.2) with SMTP id g55DXEj02897 for <vvb@mail.strace.net>; Wed, 5 Jun 2002 16:33:25 +0300
Received: from vega.maplesoft.on.ca by ns.maplesoft.on.ca via smtpd (for strace.net [212.35.162.132]) with SMTP; 5 Jun 2002 13:33:10 UT
Received: from courier.maplesoft.on.ca (courier [192.139.233.111]) by vega.maplesoft.on.ca (8.11.6/8.11.6) with ESMTP id g55DU0R28279 for <vvb@mail.strace.net>; Wed, 5 Jun 2002 09:30:00 -0400 (EDT)
Received: by courier.maplesoft.on.ca with Internet Mail Service (5.5.2653.19) id <L9RP9PVB>; Wed, 5 Jun 2002 09:30:04 -0400
Message-ID: <F17255C2B596D3119A5600508B44FA6802C36C66@courier.maplesoft.on.ca>
From: Laurent Bernardin <lbernardin@maplesoft.com>
To: "'Vladimir Bondarenko'" <vvb@mail.strace.net>
Subject: RE: Your final decision?
Date: Wed, 5 Jun 2002 09:30:04 -0400
MIME-Version: 1.0
X-Mailer: Internet Mail Service (5.5.2653.19)

Content-Type: text/plain; charset="iso-8859-1"
X-UIDL: m-U"!T=6!!JMY"!b-m"!

Dear Vladimir,

Sorry to keep you waiting for so long. Please give me a few more days to figure out some budgetting issues.

best

-Laurent

.....

Return-Path: <mseymour@maplesoft.com>
Received: (from root@localhost) by strace.net (8.10.2/8.10.2) id g69Js2U16672 for vvb@mail.strace.net. ROCMAIL; Tue, 9 Jul 2002 22:54:02 +0300
Received: from ns.maplesoft.on.ca (ns.maplesoft.on.ca [205.211.164.226]) by strace.net (8.10.2/8.10.2) with SMTP id g69Jrst16640 for <vvb@mail.strace.net>; Tue, 9 Jul 2002 22:53:58 +0300
Received: from vega.maplesoft.on.ca by ns.maplesoft.on.ca via smtpd (for strace.net [212.35.162.132]) with SMTP; 9 Jul 2002 19:53:54 UT
Received: from courier.maplesoft.on.ca (courier [192.139.233.111]) by vega.maplesoft.on.ca (8.11.6/8.11.6) with ESMTP id g69Jrek16342; Tue, 9 Jul 2002 15:53:41 -0400 (EDT)
Received: by courier.maplesoft.on.ca with Internet Mail Service (5.5.2653.19) id <NR5TH326>; Tue, 9 Jul 2002 15:53:39 -0400
Message-ID: <F17255C2B596D3119A5600508B44FA6802EF596E@courier.maplesoft.on.ca>
From: Michael Seymour <mseymour@maplesoft.com>
To: "'Vladimir Bondarenko'" <vvb@mail.strace.net>
CC: "'lbernardin@maplesoft.com'" <lbernardin@maplesoft.com>
Subject: RE: My last letters to LB
Date: Tue, 9 Jul 2002 15:53:37 -0400
MIME-Version: 1.0
X-Mailer: Internet Mail Service (5.5.2653.19)
Content-Type: text/plain; charset="koi8-r"
X-UIDL: F/$#!O,X!!6<j!!#~~!!

Good Day Vladimir

In reviewing your proposal and our situation we've decided, at present, that we ill not accept your proposal.

We thank you for contacting us about it, and wish you well on your continued work with Maple.

Michael Seymour

==========
Michael A. Seymour
VP. Operations
Waterloo Maple Inc.
Tel: 519.883.0128
Email: mike.seymour@maplesoft.com

Web: http://www.maplesoft.com/
57 Erb Street West, Waterloo, ON, Canada N2L 6C2

-----Original Message-----
From: Vladimir Bondarenko [mailto:vvb@mail.strace.net]
Sent: Saturday, June 29, 2002 7:32 AM
To: mseymour@maplesoft.com
Subject: FYI: My last letters to LB

Good day Michael.

Maybe it might help you this way or that if I would say that I had send these 2 letters to Laurent Bernardin on June 19, 2002 but still have none his response?

Best,

Vladimir B.

.....

Return-Path: <vvb@mail.strace.net>
Date: Wed, 19 Jun 2002 10:43:48 +0400
From: Vladimir Bondarenko <vvb@mail.strace.net>
X-Mailer: The Bat! (v1.44)
Reply-To: Vladimir Bondarenko <vvb@mail.strace.net>
X-Priority: 2 (High)
Message-ID: <1187375552.20020619104348@mail.strace.net>
X-Confirm-Reading-To: Vladimir Bondarenko <vvb@mail.strace.net>
Return-Receipt-To: Vladimir Bondarenko <vvb@mail.strace.net>
To: lbernardin@maplesoft.com
Subject: Your easier control over Maple 9 problems
Mime-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

Dear Laurent,

Please take my best congratulations on Maple 8!

These two weeks with your Release 8 have already convinced myself that you had fixed a number of problems. For only one example, the numerical integration got stronger.

At the same time I have collected enough information to confirm my previous claim that within 12 months, in 4 steps, I can support you with:

1) a very detailed map of bugs in hundreds Maple 8 functions. It will contain thousands of distinct bug manifestations. Naturally, it will be formatted according to your instructions.

2) a click-and-done piece of software which can (quickly) find bugs and bottlenecks for the set of selected by you functions. What I need here, is your description of the interface which is best for you and the kindred stuff.

3) hundreds manual problem reports on graphics, connectivity, and documentation. As I had told you, a sizable part of connectivity testing can be automated, too.

4) and more, but I do not want to trouble you with the details.

You wrote on Wed, 5 Jun 2002 09:30:04:

LB> Please give me a few more days to figure out some budgetting issues.

I was wondering how it was going with my possible project?

If you would like it, within a couple of days I could launch a temporary demo internet site with, say, 100 unfixed Maple 8 problems. This site would be INVISIBLE to all people except the owners of www.maplesoft.com domain name. Afterwards, I would unmount it. In fact, just in case, I have prepared a couple of versions of the site with different design.

Sure, I have also other ideas on the point.

Hoping to hear from you soon.

Best,

Vladimir

.....

Keith Geddes

James Cooper

Laurent Bernadin

Keith Geddes, James Cooper, and Laurent Bernadin claim:

Maplesoft is committed to providing the highest level of support for the products it sells.

Maplesoft is a world leader in mathematical and analytical software.

Maple 9 is the premium software system for any activity that involves mathematics.

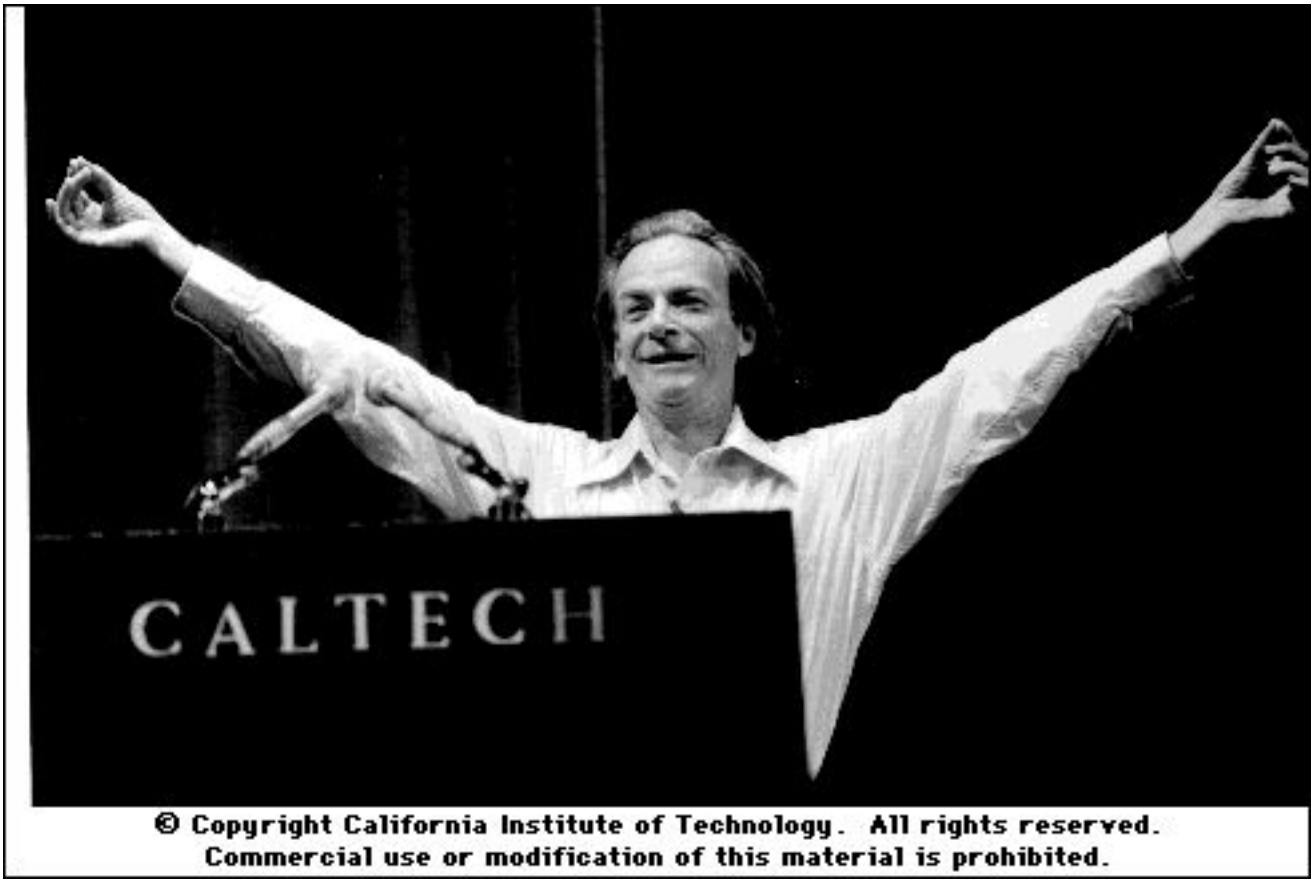
Maplesoft, a division of Waterloo Maple Inc., is a leading producer of advanced software for mathematics.

Over 3 million mathematicians, scientists and engineers world-wide use our software today.

2004

THE ART OF SIMON ATKINSON: SPACE SHUTTLE CHALLENGER

Warm-up



One of the brightest minds of the XX century, Richard Feynman states in Feynman's Appendix to the Rogers Commission Report on the Space Shuttle Challenger Accident

For a successful technology, reality must take precedence over public relations, for Nature cannot be fooled.

……

In our Review, we show that during the last years, in case with Maple, PR took precedent over reality. In other words,

False advertisement claims about Maple allegedly superior quality made by Maplesoft and disseminated publicly through the mass media channels during the last years are directed to sales volume increase via creation in the customer's mind an image of a stable and time-saving environment Maple actually is not.

Maplesoft is unmaking its own success but there is still a chance to survive in the symbolic market.

Now let's get down to facts.

……

But first the author would like to propose you a quiz (keep your options open! :-)

*1) Is multiplication of elementary functions commutative? Say, is sin(z)/z = 1/z*sin(z) ?*

2) Can Maple draw a graph of exp(z) ?

3) Can Maple draw a graph of z ? (!)

*4) Can Maple draw a set of **complex** numbers without Re/Im ?*

5) Can Maple divide 1 by 0 and get a strictly definite answer?

6) Do you still wrongly believe that sin(z)^2+cos(z)^2 = 1 ?

*7) Do you really think that cylindrical functions should have **two** arguments? What about **one** ?*

8) Will you being relatively not drunk start putting onto paper the number $10^{10^{10^{10}}}$ *?*

9) How many distinct answers Maple can generate for the same integral?

10) Do you believe that after 22 years of development Maple has learned to handle elliptic functions? Cylindrical functions? Hypergeometric functions? Meijer G function?

*11) How in reality looks the feature advertised publicly by Maplesoft as **ROCK-SOLID NUMERICS** ?*

12) How many there are Maple bugs NOT fixed during the last 10 years?

13) What is an estimation for the total number of distinct bugs in Maple? 10? 100? 1,000? 10,000? Now — what about this figure, 100,000?

14) Are you willing to acquire a random number generator for $2,000 ?

15) How many persons created this document, GEMM and VM automated testing machines, and all three Cyber Tester's sites?

16) Do you believe in Santa Claus? In the eerie Loch Ness Monster? In Maple internal thorough, professional testing?

Now a serious question comes. We kid you not.

17) Do you think you personally could identify (quickly!) thousands distinct Maple bugs, — despite the fact you have nothing to do with software testing? Possibly having an application running on your personal computer? Do you think it is too good to be true?

maple 9.5 Quick Reference Card

When Using Maple, Remember...

Command	Description

Expression Manipulation

Command	Description	Example
factor	Factor polynomials	`> factor(6*x^2+18*x-24);`
expand	Expand expressions	`> expand((x+1)^3);`
normal	Convert expressions into normal form	`> normal((x^2-y^2)/(x-y)^3);`
simplify	Simplify expressions	`> simplify(4^(1/2)+3);`
numer, demon	Extract numerator or denominator	`> numer(a/b);` `> demon(a/b);`
rhs, lhs	Extract right/left-hand side of equation	`> rhs(x=y);` `> lhs(x=y);`
eval	Evaluate expressions at a point	`> eval(x^3+2*x^2-7*x+5, x=3);`

Is Maple 9.5.1 a colossus with clay feet?

> **`interface(prompt="Maple 9.5.1 >" ):`**

Maple 9.5.1 > **`kernelopts(version);`**

```
`Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356`
```

For example, NONE of Maple versions since 1993 can calculate correctly the following simple expressions

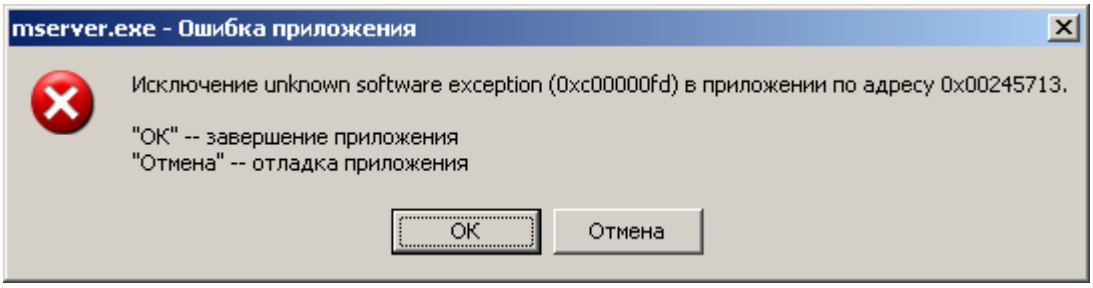
.....

DESCRIPTION: Maple does not make an attempt to see that the user's request is (far) beyond its reach in principle. Nor now neither in the future any system can output this number digit by digit because the number consists of about 10^(1.6*10^1207) digits while the amount of atoms in the Universe is just of order 10^80.

The author's question in engineering aspect, Where Maplesoft is going to find zillions of googolplexes of *universes* to store/output the requested output? In case of success with these universes, How many billions of

billions of billions years should the happy ancestors of this user wait to see at last the first lines of this majestic request?

Maple 9.5.1 > **(2^4000)!;**



EXPECTED: (best) Error, integer too large in context

(good) (2^4000)!

COMMENT: MuPAD 3.0 returns

- MuPAD 3.0> *(2^4000)!*

```
Error: Integer too large in context [specfunc::fact];
during evaluation of 'fact'
```

while Derive 6.1 and Mathematica 5.0.1 return

```
131820409343094310010388979423659136318401916109327276909280345024175692 8\
112834455107975212317212203314094075648071682303844681769424058128173106 2\
452512184038544674444386888956328970642771993930036586552924249514488832 1\
833894158323756200092849226089461110385787540779132654409185831255860504 3\
164728460363649082385000782681167246890021068910448808948534719215270882 0\
119765006125944858397761874669301278745233504796586994514054435217053803 7\
327032402834008159261693483647994727160945768940072431686625688866030658 3\
248683060612501764335646973240725287456721773369482423667532334175568183 9\
221954693820456072020253884371226826844858636194212875139566587445390068 0\
147479758139717481147704392488266886671292379541285558418744606657296304 9\
265860017933827257911002088122876736120060347897312016889399757435372765 3\
998969223092798255701666067972698906236921628764772837915526086464389161 5\
705346169567037448405029752790940875872989684235165316260908983893514490 2\
005685122107904896671887894330923207197857563987720862123704094012691276 7\
610658141079378758043403611425454744180577150855204937163460902512732551 2\
605396392214570059772472666763440181556475095153967113514875460624794445 9\
27790555554213627225045757069109493 76!
```

without crashing the system.

Maple 9.03 > **(2^4000)!**

```
Error, (in fact) Cannot allocate memory (size=184565760)
```

after 470 seconds which is NOT acceptable too.

Maple 8 > **(2^4000)!;**

```
Error, (in fact) too many levels of recursion
```

A bug, but still this bug does not kill Maple...

Maple 7 > **(2^4000)!;**

```
The instruction at 0x10093664 referenced memory at
0x08002f02. The memory could not be read from
```

Summing up, Maple is able to work well up to version 6 of 2000 inclusively, but later the things skidded.

Maple 6 > **(2^4000)!**
Maple V R 5 > **(2^4000)!**
Maple V R 4 > **(2^4000)!**
Maple V R 3 > **(2^4000)!**

```
Error, integer too large in context
Error, integer too large in context
Error, integer too large in context
Error, integer too large in context
```

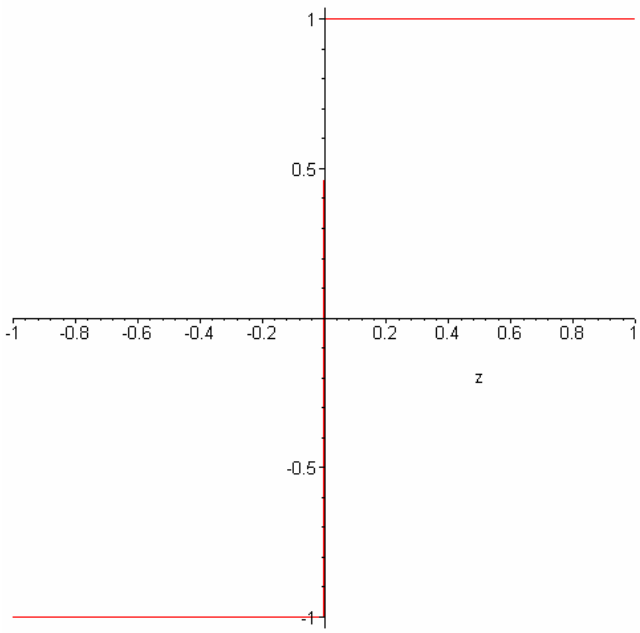
.....

Maple 9.5.1 > **evalf(Int(sqrt(-z^2)/z, z= -1..1));**

```
2.000000000*I

#   = 0.
```

Maple 9.5.1 > **plot(apply({Re,Im}, sqrt(-z^2)/z), z= -1..1);**



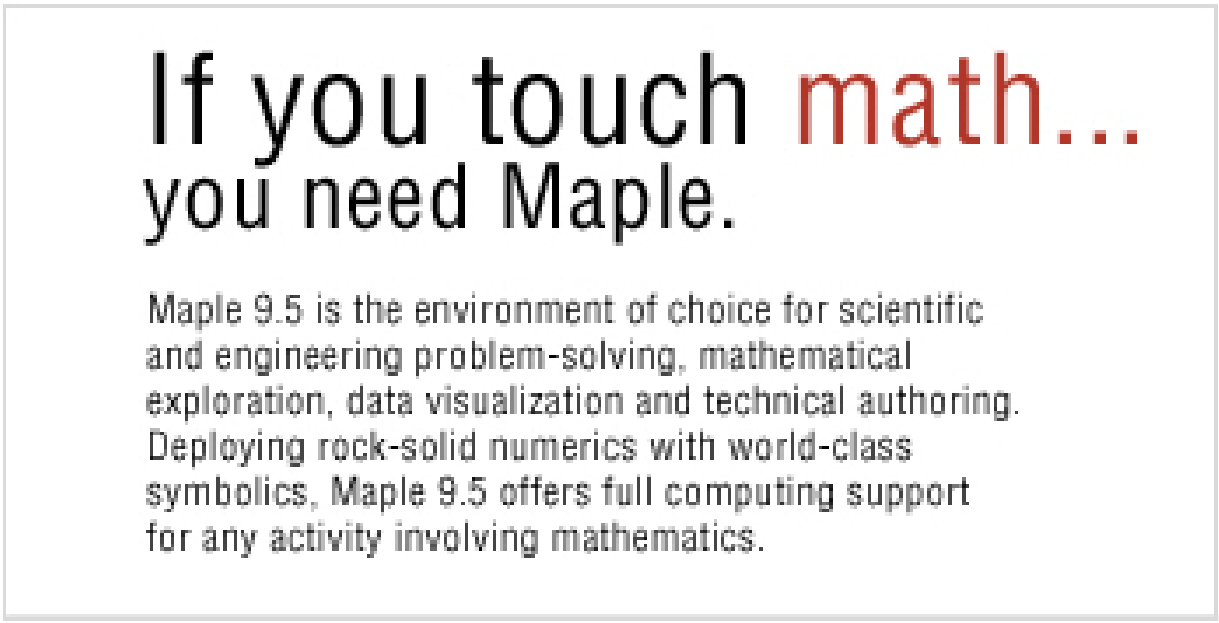
Four years ago, however, Maple was able to approximate this integral.
Maple 6 (2000) > **`evalf(Int(sqrt(-z^2)/z, z= -1..1));`**

```
                0.*I
```

In our Review, we show that the behavior like this is typical for the current revenue-based model of Maple development.

……

Maplesoft claims: http://www.maplesoft.com/



.....

Another Maplesoft's claim: http://www.maplesoft.com/products/maple/explore.shtml

Maple 9 is the premium software system for any activity that involves mathematics.

Reality? Here you are: `Over 22 years of Maple development, this fresh-level example has been never resolved.`

Maple 9.5.1 > **`limit(sin(z)^2+cos(z)^2, z=infinity);`**

`0 .. 2`

COMMENT Axiom 0.1, Derive 6.1, Mathematica 5.1, Maxima 5.9.1 and MuPAD 3.1 calculate this limit correctly.

CALCULATE ME:
limit(sin(z)^2+cos(z)^2, z=%plusInfinity)
LIM(SIN(z)^2+COS(z)^2, z, inf)
Limit[Sin[z]^2 + Cos[z]^2, z -> Infinity]
LIMIT(z,z,1);
limit(sin(z)^2+cos(z)^2, z= infinity);

1
1
1
1
1

.....

http://www.maplesoft.com/corporate/

Maplesoft, a division of Waterloo Maple Inc., is a leading producer of advanced software for mathematics.

……

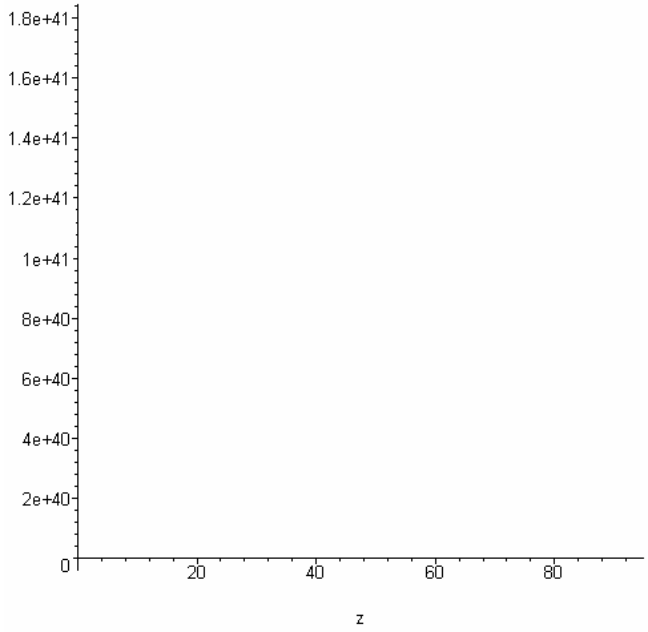
It is difficult to imagine calculus classes without exponent. One of the best, generally received student-oriented means is visualization.

In 1995, Maple was able to draw exponent. During the last 9 years, your customer see the axes only…

In a perplexed math instructor's mind a question emerges, where on earth did Maplesoft get the unblessed graph?

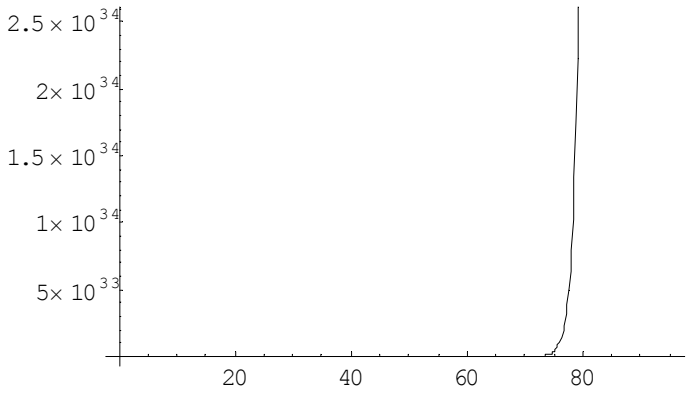
Does Maplesoft's folks *really* realize that all its competitors draw such trivial graphs, instantly?

Maple 9.5.1 (2004) > **`plot(exp(z), z=0..95);`**



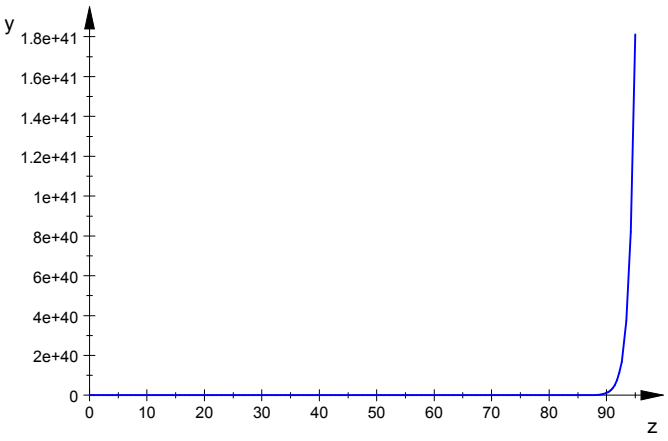
Here is Mathematica 5.

`Plot[Exp[z],{z,0,95}]`

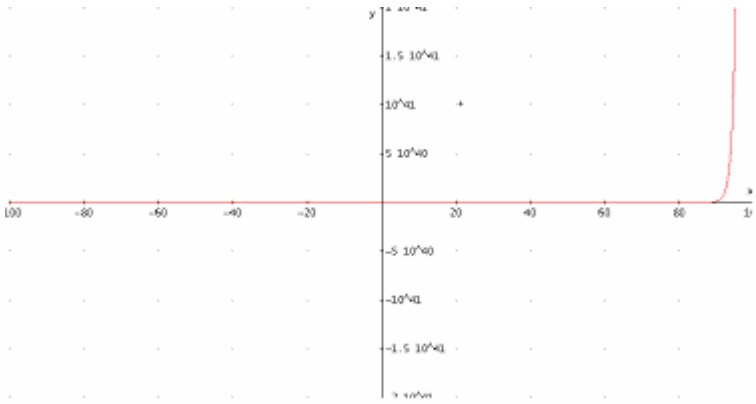


Here is MuPAD 3.1.

- `plotfunc2d(exp(z), z=0..95);`

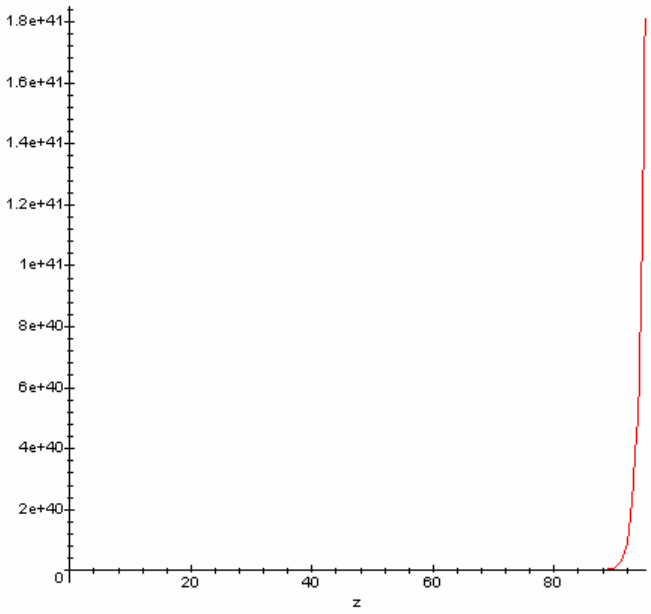


Here is Derive 6.1.

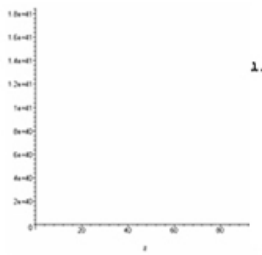
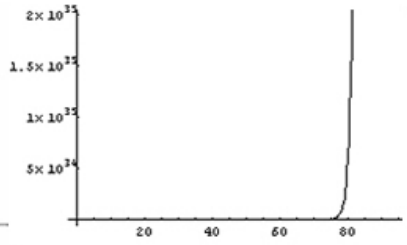
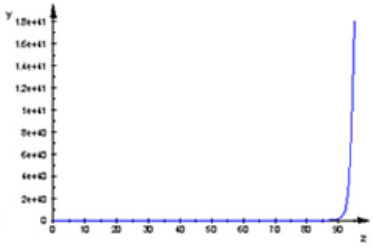
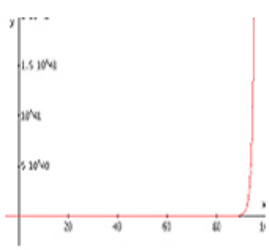


And here is Maple… 9 years ago.

Maple V Release 4 (1995) > **`plot(exp(z), z=0..95);`**

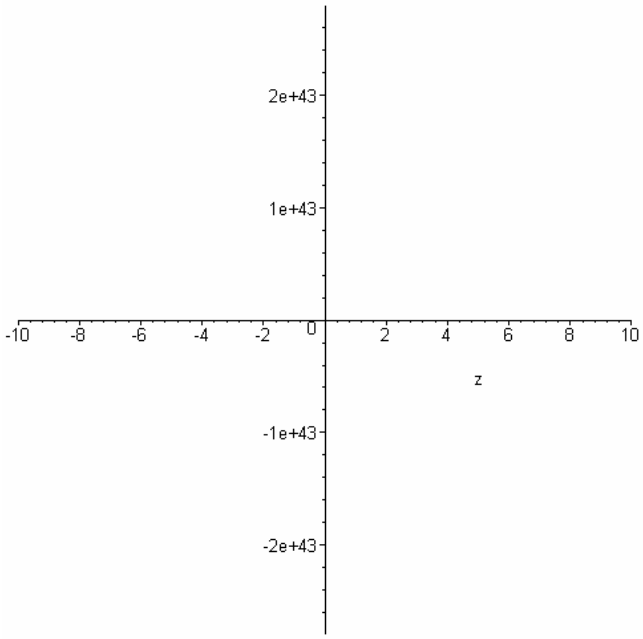


.....

Comparison of the graphs of the exponential function exp(z) drawn over the region z= 0..95			
			
Maple 9.5.1	**Mathematica 5.0.1**	**MuPAD 3.1**	**Derive 6.1**

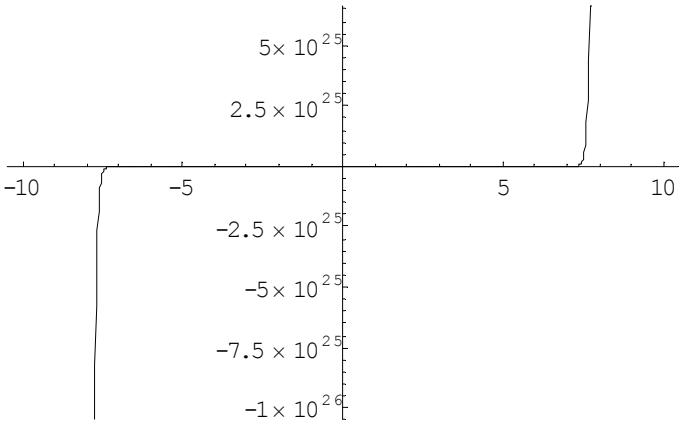
.....

Maple 9.5.1 > `plot(erf(z)*exp(z^2),z);`



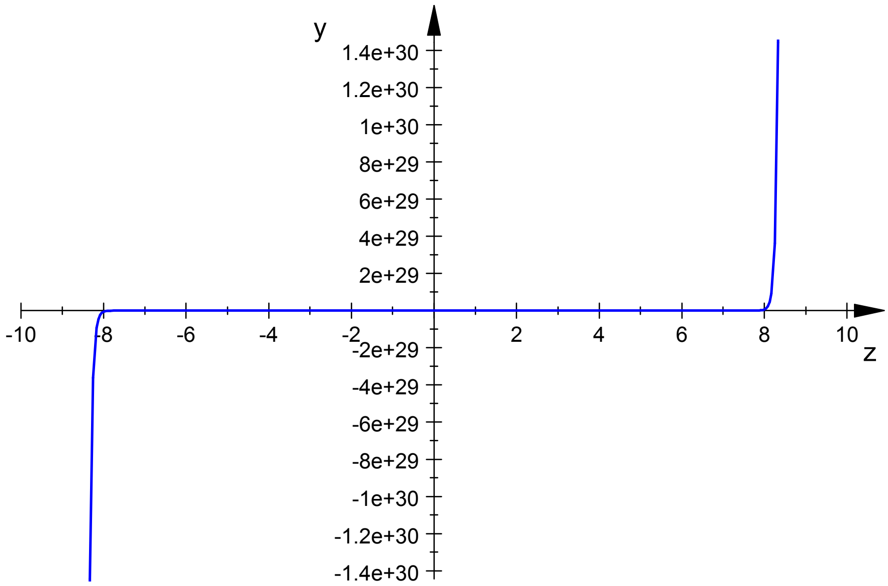
Here is Mathematica 5.

Plot[(Erf[z])*Exp[z^2],{z,-10,10}]



Here is MuPAD 3.1.

- *plotfunc2d(erf(z)*exp(z^2), z=-10..10);*



…………………………………………………………………………………………………...

!!
!!! NONE of Maple versions can calculate this limit correctly !!!
!!

Maple 9.5.1 > **limit(1/z, z= I*infinity);**

```
Error, (in limit) invalid limiting point
```

EXPECTED: 0

CHECKUP: seq(evalf(limit(1/z, z= I*10^k),1), k= 1..10);

-.1*I, -.1e-1*I, -.1e-2*I, -.1e-3*I, -.1e-4*I, -.1e-5*I, -.1e-6*I, -.1e-7*I, -.1e-8*I, -.1e-9*I

COMMENT: Derive 6 and Mathematica 5 calculate this limit correctly.

LIM(1/z, z, #i*inf)
Limit[1/z, z -> I Infinity]

0
0

…………………………………………………………………………………………………...

Maple 9.5.1 > **int(ln(z), z= 0..undefined);**

```
0
```

EXPECTED: undefined+undefined*I

CHECKUP: f := subs(a= undefined, int(ln(z), z= 1..a));
simplify(f);

undefined+undefined*I

……

Maple 9.5.1 > `int(Ei(undefined, z), z= 0..1);`

```
1-exp(-1)
```

EXPECTED: undefined+undefined*I

……

Maple 9.5.1 > `int(1, z= undefined..undefined);`

```
0
```

Maple 9.5.1 > `int(undefined, undefined= undefined..undefined);`

```
0
```

……

http://www.maplesoft.com/support/

Maplesoft is committed to providing the highest level of support for the products it sells.

A loud claim. But even a Maple Help Example does not work (!).

DESCRIPTION: According to ?fdiscont

> fdiscont(abs(x/10000),x=-1..1,0.001);

[]

Let us try it by ourselves and see what will happen...

Maple 9.5.1 >
```
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
fdiscont(abs(x/10000),x=-1..1,0.001);
```

```
[]
[-.26003941265107348e-3 .. .67866573715214586e-4]
[-.25928276258356606e-3 .. .69032288346154250e-4]
[]
[-.20774826490465719e-3 .. .22926746964761025e-3]
```

```
[]
[-.25591472406480 3006e-3 .. .722727692682864159e-4]
[]
[-.259270868191587554e-3 .. .683453020015209153e-4]
[]
```

.....

http://www.maplesoft.com/pressroom/releases/2003/maple9j.shtml

Maplesoft is a world leader in mathematical and analytical software.

.....

Old good Leibnitz?

DESCRIPTION: Only Maple 7 of 2001 can calculate this limit correctly.

Maple 9.5.1 > **limit(sum((-1)^(k-1)/k, k= 1..n), n= infinity);**

```
undefined

#   = ln(2) = .6931471806
```

CHECKUP:

```
evalf(limit(Sum((-1)^(k-1)/k, k= 1..n), n= infinity));

.6931471806
```

COMMENT: Derive 6.1 and Mathematica 5.0.1 calculate this limit correctly.

CALCULATE ME:

```
LIM(SUM((-1)^(k - 1)/k, k, 1, n), n, inf)
Limit[Sum[(-1)^(k-1)/k, {k, 1, n}], n -> Infinity]

LN(2)
Log[2]
```

.....

Maple 9.5.1 > **with(student): changevar(z= sqrt(-u^2), Int(1/(1+z^2), z= 0..infinity), u);**

```
Error, (in changevar) complex argument to max/min

#   = Int(u/(u^2-1)/(-u^2)^(1/2),u = 0 .. I*infinity)
```

.....

Maple 9.5.1 > **restart; limit(11^z*2^z/(22^z-7^z), z= infinity);**
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);

```
0
0
0
1
1
1
1
1
0
1
```

.....

Maple 9.5.1 > **limit(11^z*2^z/(22^z-6^z), z= infinity);**

```
infinity
```

.....

Maple 9.5.1 > **limit(arccsc(GAMMA(z)), z= 175);**

```
0
```

.....

Maple 9.5.1 > **limit(arctan(tan(z)), z= infinity);**

```
Error, (in limit/range) should not happen 33
```

.....

There are numerous especially striking bugs …

Maple 9.5.1> **int(z-z+z^2+z^3, z=0..1);**
int(z-z+z^2+z^3, z=0..1);
int(z-z+z^2+z^3, z=0..1);
int(z-z+z^2+z^3, z=0..1);
int(z-z+z^2+z^3, z=0..1);
int(z-z+z^2+z^3, z=0..1);
int(z-z+z^2+z^3, z=0..1);
int(z-z+z^2+z^3, z=0..1);
int(z-z+z^2+z^3, z=0..1);
int(z-z+z^2+z^3, z=0..1);

```
7/12
7/6
7/12
7/6
7/12
7/6
7/12
7/6
7/12
7/6
```

Bold mathematicians from Maplesoft are often ahead of their time. For example they beat both our old good Chebyshev and modern Risch with their non-integrability results

```
Maple 9.5.1 > int((1+z)^z, z);
Maple 9.5.1 > int((z-1)^z, z);
Maple 9.5.1 > int(1/(2+z)^z, z);
Maple 9.5.1 > int(1/(2+z^2)^z, z);
Maple 9.5.1 > int((z-1)^(1/(1+z)), z);

Maple 9.5.1 > int((-z^2-z)^sin(z), z);
```

```
z*hypergeom([1, -z],[2],-z)
(-1)^z*z*hypergeom([1, -z],[2],z)
2^(-z)*z*hypergeom([1, z],[2],-1/2*z)
2^(-z)*z*hypergeom([1/2, z],[3/2],-1/2*z^2)
(-1)^(1/(z+1))*z*hypergeom([1, -1/(z+1)],[2],z)

(-1)^sin(z)/(sin(z)+1)*z^(sin(z)+1)*hypergeom([-sin(z), sin(z)+1],
[2+sin(z)],-z)
```

Another example?

```
Maple 9.5.1 > int(BesselJ(0, z^2+z), z);
```

```
(z^2+z)*BesselJ(0,z^2+z)+1/2*Pi*(z^2+z)*(StruveH(0,z^2+z)*BesselJ(1,z^2+z)-
StruveH(1,z^2+z)*BesselJ(0,z^2+z))
```

Compare

```
Maple 9.5.1 > convert(int(series(BesselJ(0, z^2+z), z),z), polynom);
              convert(series(int(BesselJ(0, z^2+z), z),z), polynom);
```

```
z-1/12*z^3-1/8*z^4-3/64*z^5+1/96*z^6
z+z^2-1/12*z^3-1/4*z^4-79/320*z^5
```

Get the brilliance of 1000 cocktailed (loony?) mathematicians!

```
Maple 9.5.1 > int(BesselJ(z, z), z);
```

```
-1/2*z*BesselJ(z,z)*Pi*(cot(1/2*Pi*(z-1))*AngerJ(z-1,z)+WeberE(z-1,z))-
1/2*z*BesselJ(z-1,z)*Pi*(tan(1/2*Pi*z)*AngerJ(z,z)-WeberE(z,z))
```

```
Maple 9.5.1 > int(BesselY(z, z), z);
```

```
-1/2*z*BesselY(z,z)*Pi*(cot(1/2*Pi*(z-1))*AngerJ(z-1,z)+WeberE(z-1,z))-
```

```
1/2*z*BesselY(z-1,z)*Pi*(tan(1/2*Pi*z)*AngerJ(z,z)-WeberE(z,z))
```

Maple 9.5.1 > **int(BesselI(z, z), z);**

```
2^(-1-z)/(1/2*z+1/2)*z^(1+z)*hypergeom([1/2*z+1/2],[1+z, 3/2+1/2*z],
1/4*z^2)/GAMMA(1+z)
```

Maple 9.5.1 > **int(BesselK(z, z), z);**

```
2^(-2-z)/(1/2*z+1/2)*z^(1+z)*hypergeom([1/2*z+1/2],[1+z, 3/2+1/2*z],
1/4*z^2)*GAMMA(-z)+2^(-2+z)/(-1/2*z+1/2)*z^(1-z)*hypergeom([-1/2*z+1/2],
[1-z, 3/2-1/2*z],1/4*z^2)*GAMMA(z)
```

Maple 9.5.1 > **int(WeberE(z, z), z);**

```
2*sin(1/2*Pi*z)^2/Pi*hypergeom([1/2, 1],[3/2, 1-1/2*z, 1+1/2*z],-
1/4*z^2)+1/4*cos(1/2*Pi*z)^2/Pi/(-1/2+1/2*z)/(1/2*z+1/2)*z^2*hypergeom([1,
1],[2, 3/2+1/2*z, 3/2-1/2*z],-1/4*z^2)
```

Maple 9.5.1 > **int(AngerJ(z, z), z);**

```
2*cos(1/2*Pi*z)/Pi*sin(1/2*Pi*z)*hypergeom([1/2, 1],[3/2, 1-1/2*z,
1+1/2*z],-1/4*z^2)-1/4*sin(1/2*Pi*z)/Pi*cos(1/2*Pi*z)/(-1/2+1/2*z)
/(1/2*z+1/2)*z^2*hypergeom([1, 1],[2, 3/2+1/2*z, 3/2-1/2*z],-1/4*z^2)
```

.....

Maple 9.5.1 > **int(KelvinBer(z, z), z);**
int(KelvinBei(z, z), z);
int(KelvinKer(z, z), z);
int(KelvinKei(z, z), z);
int(StruveH(z, z), z);
int(StruveL(z, z), z);
int(Ei(z, z), z);
int(EllipticK(z), z);

```
Pi*(-2^(-4-z)/Pi/(1/4*z+3/4)*z^(3+z)*hypergeom([1/4*z+3/4],[3/2, 1+1/2*z,
3/2+1/2*z, 7/4+1/4*z],-1/256*z^4)*sin(3/4*Pi*z)/GAMMA(2+z)+2^(-2-
z)/Pi/(1/4*z+1/4)*z^(1+z)*hypergeom([1/4*z+1/4],[1/2, 1+1/2*z, 1/2*z+1/2,
5/4+1/4*z],-1/256*z^4)*cos(3/4*Pi*z)/GAMMA(1+z))

Pi*(2^(-4-z)/Pi/(1/4*z+3/4)*z^(3+z)*hypergeom([1/4*z+3/4],[3/2, 1+1/2*z,
3/2+1/2*z, 7/4+1/4*z],-1/256*z^4)*cos(3/4*Pi*z)/GAMMA(2+z)+2^(-2-
z)/Pi/(1/4*z+1/4)*z^(1+z)*hypergeom([1/4*z+1/4],[1/2, 1+1/2*z, 1/2*z+1/2,
5/4+1/4*z],-1/256*z^4)*sin(3/4*Pi*z)/GAMMA(1+z))

-2^(-4-z)/(1/4*z+3/4)*(-1-1/2*z)*z^(3+z)*hypergeom([1/4*z+3/4],[3/2,
1+1/2*z, 3/2+1/2*z, 7/4+1/4*z],-1/256*z^4)*sin(1/4*Pi*z)*GAMMA(-2-z)-2^(-
4+z)/(3/4-1/4*z)*(-1+1/2*z)*z^(3-z)*hypergeom([3/4-1/4*z],[3/2, 1-1/2*z,
3/2-1/2*z, 7/4-1/4*z],-1/256*z^4)*sin(3/4*Pi*z)*GAMMA(-2+z)+2^(-2-
z)/(1/4*z+1/4)*(-1/2*z-1/2)*z^(1+z)*hypergeom([1/4*z+1/4],[1/2, 1+1/2*z,
1/2*z+1/2, 5/4+1/4*z],-1/256*z^4)*cos(1/4*Pi*z)*GAMMA(-1-z)+2^(-2+z)/(-
1/4*z+1/4)*(-1/2+1/2*z)*z^(1-z)*hypergeom([-1/4*z+1/4],[1/2, 1-1/2*z, -
1/2*z+1/2, 5/4-1/4*z],-1/256*z^4)*cos(3/4*Pi*z)*GAMMA(z-1)

-2^(-4-z)/(1/4*z+3/4)*(-1-1/2*z)*z^(3+z)*hypergeom([1/4*z+3/4],[3/2,
1+1/2*z, 3/2+1/2*z, 7/4+1/4*z],-1/256*z^4)*cos(1/4*Pi*z)*GAMMA(-2-z)-2^(-
4+z)/(3/4-1/4*z)*(-1+1/2*z)*z^(3-z)*hypergeom([3/4-1/4*z],[3/2, 1-1/2*z,
3/2-1/2*z, 7/4-1/4*z],-1/256*z^4)*cos(3/4*Pi*z)*GAMMA(-2+z)-2^(-2-
```

```
z)/(1/4*z+1/4)*(-1/2*z-1/2)*z^(1+z)*hypergeom([1/4*z+1/4],[1/2, 1+1/2*z,
1/2*z+1/2, 5/4+1/4*z],-1/256*z^4)*sin(1/4*Pi*z)*GAMMA(-1-z)-2^(-2+z)/(-
1/4*z+1/4)*(-1/2+1/2*z)*z^(1-z)*hypergeom([-1/4*z+1/4],[1/2, 1-1/2*z, -
1/2*z+1/2, 5/4-1/4*z],-1/256*z^4)*sin(3/4*Pi*z)*GAMMA(z-1)

2^(-1-z)/Pi^(1/2)/(1+1/2*z)*z^(2+z)*hypergeom([1, 1+1/2*z],[3/2, 2+1/2*z,
z+3/2],-1/4*z^2)/GAMMA(z+3/2)

2^(-1-z)*exp(-1/2*I*z*Pi)/Pi^(1/2)/(1+1/2*z)*z^(2+z)*(-1)^(1/2*z)*
hypergeom([1, 1+1/2*z],[3/2, 2+1/2*z, z+3/2],1/4*z^2)/GAMMA(z+3/2)

1/(z-1)*z*hypergeom([1, 1-z],[2, 2-z],-z)+Pi*csc(Pi*z)/GAMMA(1+z)*z^z

1/2*Pi*z*hypergeom([1/2, 1/2, 1/2],[1, 3/2],z^2)
```

.....

Maple 9.5.1 > **int(Psi(2, z^(3/2)), z);**

```
2*Psi(1,z^(1/2))*z^(1/2)-2*Psi(z^(1/2))
```

.....

Maple 9.5.1 > **int(ln(z)*abs(exp(z)/z), z);**

```
0
```

.....

Maple 9.5.1> **int(arccsc(z), z= 0..1/2); evalf(%);**

```
-1/2*I*Pi+1/4*Pi+1/2*I*ln(2+3^(1/2))-ln(2)+ln(1+I*3^(1/2))

.7853981636+.1348801725*I

#   = 1/2*I*Pi+1/4*Pi-1/2*I*ln(2+3^(1/2))-ln(2)+ln(1-I*3^(1/2))
#   = .7853981636-.1348801725*I
```

.....

Maple 9.5.1 > **convert(abs(1+I*z^2), piecewise);**

```
 -1-I*z^2
```

Compose your features! The festivity is going forward.

Maple 9.5.1 > **f := abs(1/(1+z^2*I)):**
convert(f, piecewise);
convert(convert(f, signum), piecewise);

```
1/(-1-I*z^2)
1/(1+I*z^2)
```

.....

DESCRIPTION: Introducing a constant into the integrand results in an invalid answer. Only Maple V, Release 4 of 1995 and Maple V, Release 3 of 1994 can calculate this integral correctly.

```
Maple 9.5.1 > int(GAMMA(1/3)/(sqrt(z-1)*z),  z= 1..infinity);

                0

                #  = 2/3*Pi^2*3^(1/2)/GAMMA(2/3)  =  8.416133627

Maple 9.5.1 > GAMMA(1/3)*int(1/(sqrt(z-1)*z),  z= 1..infinity);

               2/3*Pi^2*3^(1/2)/GAMMA(2/3)
```

.....

```
Maple 9.5.1 > int(1/(1+z^2), z= -infinity..I*infinity);

               Error, (in Limit) Limit uses a 3rd argument, dir, which is missing

               # = 0  # limit(int(1/(1+z^2),z= -a..I*a,CauchyPrincipalValue), a=infinity)
```

.....

```
Maple 9.5.1 > int(sin(ln(z)/ln(2)), z= 0..1);

                undefined

                # = -ln(2)/(1+ln(2)^2)  =  -.4681993782
```

.....

```
Maple 9.5.1 > int(abs(ln(z)), z= -1..1); evalf(%);

               -I*Pi+2

               2.-3.141592654*I

               #  = 1+Pi^2*(StruveH(1,Pi)-BesselY(1,Pi))/2  =  4.409231818
```

.....

BUG # XXXXX	int (1-D): TRIVIAL INTEGRAL IS UNEVALUATED	
REGRESSION	NO	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	ABSENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	ABSENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	ABSENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	ABSENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	PRESENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	PRESENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	PRESENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	PRESENT	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	PRESENT	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

DESCRIPTION:	It took Maplesoft 9 years (1994-2003) to fix this bug.
EXPRESSION:	int(1/z, z= -infinity..infinity, CauchyPrincipalValue);
ACTUAL:	int(1/z,z = -infinity .. infinity,CauchyPrincipalValue)
EXPECTED:	0
COMMENT:	This integral is one of the most favorite examples calculus instructors explain to their students.
COMMENT:	MuPAD 3 calulates this integral correctly. int(1/z, z=-infinity..infinity, PrincipalValue); 0

……

……

BUG # XXXXX	is: INVALID false	
REGRESSION	NO	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	ABSENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	ABSENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	PRESENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	FAIL	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	FAIL	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	FAIL	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	FAIL	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	FAIL	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994
DESCRIPTION:	It took Maplesoft 10 years (1994-2004) to fix this bug.	
EXPRESSION:	is(exp(I*z)-cos(z)-I*sin(z)=0);	
ACTUAL:	false	
EXPECTED:	true	
HINT:	is(convert(exp(I*z)-cos(z)-I*sin(z), exp) = 0); true	
COMMENT:	FAIL = Maple returns FAIL .	

....

Maple 9.5.1 >
```
int(signum(z^a*(z^a - 1)), z= 0..1);
int(signum(z^1*(z^1 - 1)), z= 0..1);
int(signum(z^2*(z^2 - 1)), z= 0..1);
int(signum(z^3*(z^3 - 1)), z= 0..1);

1
-1
-1
-1
```

....

Maple 9.5.1 >
```
int((1-z)^(1/3)/(1+z^2), z= 0..infinity); evalf(%);

3*sum(_R*ln(1-1296*_R^4-6*_R),_R = RootOf(23328*_Z^6+216*_Z^3+1))-3*
sum(_R*ln(-1296*_R^4-6*_R),_R = RootOf(23328*_Z^6+216*_Z^3+1))+3*sum(
_R*ln(6)+_R*ln(-216*_R^4-_R),_R = RootOf(23328*_Z^6+216*_Z^3+1))

-2.260048918+0.*I

#  = 3/4*hypergeom([1/2, 1, 1],[7/6, 5/3],-1)+Pi*(1/4*2^(2/3)-1/12*\
#    3^(1/2)*2^(2/3))+I*Pi*(1/4*3^(1/2)*2^(2/3)-1/4*2^(2/3))
#
#  = 1.146113216+.9126783944*I
```

....

Maple 9.5.1 >
```
int(int(arctan(1,x*y), x= 0..1), y= 0..1);

int(PIECEWISE([undefined, And(0 < (-1/y^2)^(1/2),(-1/y^2)^(1/2) < 0,-(-
1/y^2)^(1/2) < 1,(-1/y^2)^(1/2) < 1)],[undefined, And((-1/y^2)^(1/2) < 0,-
(-1/y^2)^(1/2) < 1)],[undefined, And(0 < (-1/y^2)^(1/2),(-1/y^2)^ (1/2) <
1)],[-1/2*(2*I*ln((y+I)/(y^2+1)^(1/2))*y-ln(y^2+1)+2*ln(2) +2* ln(-
1/2*y/(I*y)^(1/2))-ln(2*I*y)-2*ln(y/(-I*y)^(1/2))+ln(-2*I*y))/y,
otherwise]),y = 0 .. 1)
```

....

BUG # XXXXX int (2-D): INVALID FORMULA

!!!
!!! NONE of Maple versions can calculate this integral correctly !!!
!!!

REGRESSION	NO
REPRODUCIBLE	ALWAYS
BUG HISTORY:	PRESENT Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	PRESENT Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	PRESENT Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	PRESENT Maple V, Release 5, IBM INTEL NT, Nov 27 1997

```
                    PRESENT   Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
                    PRESENT   Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION:         int(int((x-y)^(1/3), x= 0..a), y= 0..a);

ACTUAL:             0

EXPECTED:           9/28*((-a)^(1/3)+a^(1/3))*a^2

CHECKUP:            evalf(subs(a=1, 9/28*((-a)^(1/3)+a^(1/3))*a^2));
                    evalf(Int(Int((x-y)^(1/3), x= 0..1), y= 0..1),2);
                    #  Maple hangs with Digits = 3, adding Mathematica...
                    NIntegrate[(x - y)^(1/3), {y, 0, 1}, {x, 0, 1}]

                    .4821428571+.2783653083*I
                    .48+.28*I
                    0.482143 + 0.278365 I

                    evalf(subs(a=I, 9/28*((-a)^(1/3)+a^(1/3))*a^2));
                    evalf(Int(Int((x-y)^(1/3), x= 0..I), y= 0..I),2);
                    #  Full failure in Maple, adding Mathematica...
                    NIntegrate[(x - y)^(1/3), {y, 0, I}, {x, 0, I}]

                    -.5567306166+0.*I
                    Error, (in evalf/int) Unable to handle definite integral OOOPS!
                    -0.556731

                    evalf(subs(a=1+I, 9/28*((-a)^(1/3)+a^(1/3))*a^2));
                    evalf(Int(Int((x-y)^(1/3), x= 0..1+I), y= 0..1+I),2);
                    #  Again, full failure in Maple, adding Mathematica...
                    NIntegrate[(x - y)^(1/3), {y, 0, 1+I}, {x, 0, 1+I}]

                    .3234766953+1.207231462*I
                    Error, (in evalf/int) Unable to handle definite integral
                    0.323477 + 1.20723 I

COMMENT:            Derive 6.1 and Mathematica 5.0.1 calculate this integral correctly.

INTEGRATE ME:       INT(INT((x - y)^(1/3), x, 0, a), y, 0, a)
                    Integrate[(x - y)^(1/3), {y, 0, a}, {x, 0, a}]

                    9*(-a)^(7/3)/28 + 9*a^(7/3)/28
                    (9/28)*((-a)^(1/3) + a^(1/3))*a^2
```

.....

Maple 9.5.1 > **`sum(1/sqrt(n), n= 0..infinity);`**

```
infinity

#  This sum does not exist because it includes the term  1/sqrt(0) .
```

.....

Maple 9.5.1 > **sum(1/n, n= -infinity..-2);**

```
Error, (in cot) numeric exception: division by zero
```

```
#   = Float(-infinity)
```

.....

Maple 9.5.1 > **sum(sum(n/m!, m= 0..n), n= 0..1);**

```
Error, (in NumericRange) summand is singular in the interval of
summation
```

```
#   = 2
```

.....

Maple 9.5.1 > **sum(signum((-1)^n), n= 0..infinity);**

```
-1/2*signum(FAIL[1])+1/2
```

.....

Maple 9.5.1 > **sum(1/(n*(n^4+1)), n= 1..infinity);**

```
-infinity*signum(-1+1/4*Sum(1,_alpha = RootOf(_Z^4+1)))+1/4*Sum(Psi(1-
_alpha),_alpha = RootOf(_Z^4+1))+gamma
```

.....

Maple 9.5.1 > **sum(1/sum(1+n^2*j^2, j= 1..n), n= 1..infinity);**

```
signum(1+1/73082*Sum(2377*_alpha^2+2286*_alpha^3-18304 +177* _alpha,
_alpha = RootOf(6+2*_Z^4+3*_Z^3+_Z^2)))*infinity+gamma-1/73082*
Sum((2377*_alpha^2+2286*_alpha^3-18304+177*_alpha)*Psi(1-_alpha), _alpha =
RootOf(6+2*_Z^4+3*_Z^3+_Z^2))
```

.....

NONE

Maple 9.5.1 > **sum(ln(n)/sqrt(n), n= 1..infinity); evalf(%);**

```
-1/4*Zeta(1/2)*(2*gamma+6*ln(2)+2*ln(Pi)+Pi)
```

```
3.922646140
```

```
#   = infinity
```

.....

Maple 9.5.1 > **evalf(Int(z, z= 0..1/10^154));**

```
0.
```

....

Maple 9.5.1 > `evalf(Int(exp(z), z= 0..707));`

`Float(infinity)`

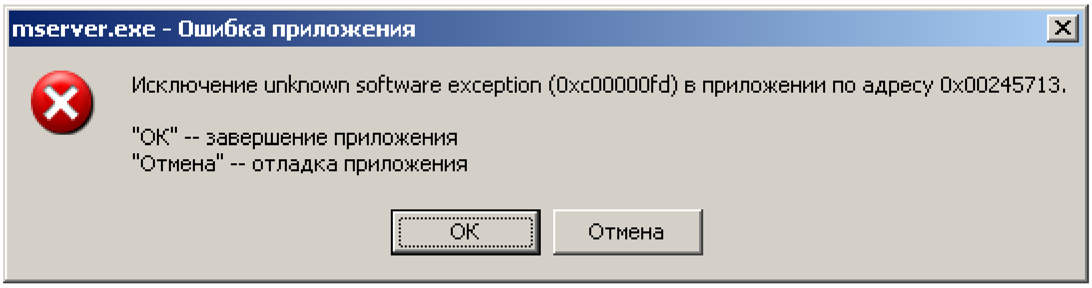
....

Maple 9.5.1 > `evalf(Int(1/z^2, z= I..infinity));`

`Error, (in evalf/int) non-numeric integration limit encountered`

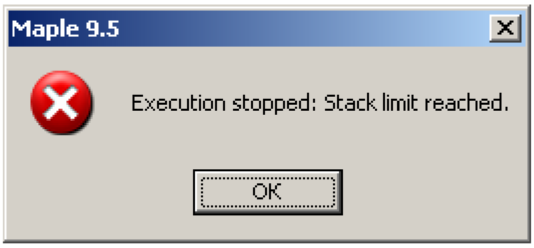
....

Maple 9.5.1 > `evalf(Int(HermiteH(1,1/z), z=0..1));`



....

Maple 9.5.1 > `evalf(Int(hypergeom([],[1-z],1/3), z= 1..2));`



....

!!

!!! NONE of Maple versions can approximate this integral correctly !!!

!!

Maple 9.5.1 > `evalf(Int(exp(z^2), z= -I*infinity..I*infinity));`

`Float(undefined)`

`#   = 1.772453851*I    # ← evalf(int(exp(z^2),z=-I*infinity..I*infinity));`

All specific quadrature methods fail also in all versions where they are implemented…(hmm..implemented?)

Maple 9.5.1 > `evalf(Int(exp(z^2), z= -I*infinity..I*infinity, 10, _CCquad));`
`evalf(Int(exp(z^2), z= -I*infinity..I*infinity, 10, _DEFAULT));`

```
evalf(Int(exp(z^2), z= -I*infinity..I*infinity, 10, _Dexp));
evalf(Int(exp(z^2), z= -I*infinity..I*infinity, 10, _Gquad));
evalf(Int(exp(z^2), z= -I*infinity..I*infinity, 10, _NCrule));
evalf(Int(exp(z^2), z= -I*infinity..I*infinity, 10, _Sinc));

Float(undefined)
Float(undefined)
Float(undefined)
Int(exp(z^2),z = Float(-infinity)*I .. Float(infinity)*I)
Int(exp(z^2),z = Float(-infinity)*I .. Float(infinity)*I)
Float(undefined)
```

etc

.....

Maple 9.5.1 >
```
evalf(Sum(1, n= 1..infinity));
evalf(sum(1, n= 1..infinity));

0.
Float(infinity)
```

.....

Maple 9.5.1 >
```
evalf(Sum(2^n, n= 1..infinity));
evalf(sum(2^n, n= 1..infinity));

-2.000000000
Float(infinity)
```

.....
.....

Maple 9.5.1 >
```
evalf(sum(ln(cosh(n)-sinh(n)), n= 1..15));
evalf(Sum(ln(cosh(n)-sinh(n)), n= 1..15));

Float(-infinity)
Float(-infinity)
```

.....

Maple 9.5.1 >
```
evalf(EllipticE(I,I));

Error, (in evalf/Elliptic/E_M) invalid input: expected evalf[] index
to be of type posint but received 22+Dm

#   = .7119586598*I    #  ←  evalf(convert(EllipticE(I,I), Int));
```

.....

Maple 9.5.1 >
```
evalf(JacobiZeta(1, 1));

Maple keeps running after 40,000 seconds…
```

.....

Maple 9.5.1 > **evalf(EllipticPi(I, I, I));**

Maple keeps running after 40,000 seconds…

Maple 9.03 > **evalf(EllipticPi(I, I, I));**

```
.3842502263+1.039758078*I
```

……

Maple 9.5.1 > **int(arcsech(z+I), z= -1..1);**

Maple keeps running after 40,000 seconds…

……

Maple 9.5.1 > **assume(n>0,m>0);**
sum(binomial(n, n+i), i= 0..m);

Maple keeps running after 40,000 seconds…

Maple 9.03 > **assume(n>0,m>0);**
sum(binomial(n, n+i), i= 0..m);

```
1-binomial(n,m+1+n)*hypergeom([1, m+1],[m+2+n],-1)
```

……

Maple 9.5.1 > **evalf(MeijerG([[0], []],[[0], []], 0));**

```
Error, (in ln) numeric exception: division by zero
```

```
#   = 1.    #  ←  evalf(simplify(MeijerG([[0], []],[[0], []],0)));
```

……

Maple 9.5.1 > **evalf(Int((-1)^(1/3) / z^(3/2), z= 1..infinity, _CCquad));**

```
Float(-infinity)-Float(infinity)*I    #  !
```

```
#   = 1.000000000 + 1.732050808*I      #  integral is obviously convergent
```

Maple 9.5.1 > **evalf(Int(convert((-1)^(1/3), exp) / z^(3/2), z= 1..infinity, _CCquad));**

```
1.000000000+1.732050808*I                #  now we have a correct answer
```

……

Maple 9.5.1 > **evalf(Int(1/(sqrt(1+z)+sqrt(1-z)), z=-infinity..infinity));**

Maple keeps running after 40,000 seconds…

```
#   = Float(infinity)-Float(infinity)*I
```

```
Maple 9.5.1 > evalf(Int(exp(-round(z)),z= 0..infinity, _Sinc));
              evalf(Int(sqrt(z)*ceil(1-5*z), z= 0..1, _Sinc));

               Error, (in evalf/int) contradictory assumptions
               Error, (in evalf/int) contradictory assumptions

               #   = Float(infinity)
               #   = -.9848502092
```

```
Maple 9.5.1 > evalf(Int(1/arccos(z)^2, z= 0..1));

              .1099511628e13

              #   = Float(infinity)
```

```
Maple 9.5.1 > expr := EllipticF(1/6*2^(1/2)*(-3*I*3^(1/2)+3)^(1/2)*3^(1/2),
              2^(1/2)*3^(1/4)*(I/(3+I*3^(1/2)))^(1/2)):

              evalf(expr);
              evalf(evalf(expr,20));

              1.130025703-1.130070553*I
              1.130057047-1.130057047*I
```

```
Maple 9.5.1 > evalf(Int(Int(1, x= 0..I), y= 0..1));

              Error, (in evalf/int) Unable to handle definite integral

              #   = 1.*I        #  evalf(int(int(1, x= 0..I), y= 0..1));  ->  1.*I
```

```
Maple 9.5.1 > evalf(Int(Int(sqrt(x), x=-1..1), y=0..1,_DEFAULT));

               Error, (in evalf/int) invalid arguments

               #   = .6666666667+.6666666667*I
```

```
Maple 9.5.1 > evalf(Int(Int(sqrt(x-y), x= 0..1, _DEFAULT), y= 0..1,
               _DEFAULT));

               Error, (in evalf/int) invalid arguments

               #   = -.2666666667+.2666666667*I
```

....

Maple 9.5.1 > **evalf(Int(Int(1/(x+y)^I, x= 0..1), y= 0..1));**

```
Error, (in evalf/int) Unable to handle definite integral

#  = .8744490922+.675021711e-1*I
```

....

Maple 9.5.1 > **time(evalf(Int(Int(sqrt(x-y), x= 0..1), y= 0..1)));**

```
999.638
```

....

Maple 9.5.1 > **evalf(Int(Int(exp(-x^2-y^2-I*x*y), x= -infinity..infinity), y= -infinity..infinity));**

```
Error, (in evalf/int) Unable to handle definite integral

#  = 2.809925892
```

....

BUG # XXXXX evalf: MEANINGLESS OUTPUT

!!!
!!! NONE of Maple versions can approximate this integral correctly !!!
!!!

REGRESSION NO

REPRODUCIBLE ALWAYS

BUG HISTORY:
PRESENT Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
PRESENT Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
PRESENT Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
PRESENT Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
PRESENT Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
PRESENT Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
PRESENT Maple V, Release 5, IBM INTEL NT, Nov 27 1997
PRESENT Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
PRESENT Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

DESCRIPTION: The approximation result involves an integration variable name.

EXPRESSION:
evalf(int(Int(sqrt(x*y), x= 0..1), y= 0..1));
evalf(int(Int(sqrt(x+y), x= 0..1), y= 0..1));

ACTUAL:
.6666666667*x^(1/2)
-.6666666667*x^(3/2)+.6666666667*(x+1.)^(3/2)

EXPECTED: .4444444444

```
                    .9751611337

CHECKUP:            evalf(int(int(sqrt(x*y), x= 0..1), y= 0..1));
                    evalf(int(int(sqrt(x+y), x= 0..1), y= 0..1));

                    .4444444444
                    .9751611337

COMPARE:            evalf(int(Int(x*y, x= 0..1), y= 0..1));
                    evalf(int(Int(1/(x+y), x= 0..1), y= 0..1));
                    evalf(int(Int(exp(x+y), x= 0..1), y= 0..1));
                    evalf(int(Int(ln(x+y), x= 0..1), y= 0..1));
                    evalf(int(Int(sin(x+y), x= 0..1), y= 0..1));
                    evalf(int(Int(cos(x+y), x= 0..1), y= 0..1));
                    evalf(int(Int(arctan(x+y), x= 0..1), y= 0..1));
                    evalf(int(Int(arccot(x+y), x= 0..1), y= 0..1));
                    evalf(int(Int(BesselJ(0,x+y), x= 0..1), y= 0..1));
                    evalf(int(Int(exp(x*y), x= 0..1), y= 0..1));
                    evalf(int(Int(ln(x*y), x= 0..1), y= 0..1));
                    evalf(int(Int(sin(x*y), x= 0..1), y= 0..1));
                    evalf(int(Int(cos(x*y), x= 0..1), y= 0..1));
                    evalf(int(Int(arctan(x*y), x= 0..1), y= 0..1));
                    evalf(int(Int(arccot(x*y), x= 0..1), y= 0..1));
                    evalf(int(Int(BesselJ(0,x*y), x= 0..1), y= 0..1));

                    .2500000000
                    1.386294361
                    2.952492442
                    -.1137056389
                    .7736445428
                    .4967514483
                    .7444323448
                    .8263639820
                    .7387313222
                    1.317902151
                    -2.000000000
                    .2398117420
                    .9460830704
                    .2332078148
                    1.337588512
                    .9728384477
```

.....

```
Maple 9.5.1 > evalf(Int(ln(1/(exp(z)+BesselJ(0,z))), z= 0 .. 1));
              evalf(Int(ln(1/(exp(z)+BesselY(0,z))), z= 0 .. 1));
              evalf(Int(ln(1/(exp(z)+BesselI(0,z))), z= 0 .. 1));
              evalf(Int(ln(1/(exp(z)+BesselK(0,z))), z= 0 .. 1));

              Error, (in evalf/int) invalid subscript selector
              Error, (in evalf/int) invalid subscript selector
              Error, (in evalf/int) invalid subscript selector
              Error, (in evalf/int) invalid subscript selector
```

```
# = -.9573473024 J
# = ???????????? Y
# = -1.011024124 I
# = -1.069629849 K
```

.....

Maple 9.5.1 >
```
expr := Sum((Psi(1+n)-2*Psi(2+n))/(2^n), n= 0..1):
evalf(expr);
evalf(simplify(expr));
```

```
-2.134176503
Error, (in evalf/Sum1) numeric exception: division by zero

#  = -2.134176503
#  = -2.134176503
```

.....

Maple 9.5.1 >
```
evalf(sum(1/round(sqrt(n))^3, n= 1..infinity));
evalf(Sum(1/round(sqrt(n))^3, n= 1..infinity));
```

```
2.000000000
2.000000000
```

Maple 9.5.1 >
```
evalf(sum(1/round(sqrt(n))^3, n= 1..100));
evalf(sum(1/round(sqrt(n))^3, n= 1..1000));
evalf(sum(1/round(sqrt(n))^3, n= 1..10000));
```

```
3.089535462
3.226625541
3.269867800
```

.....

Maple 9.5.1 >
```
evalf(sum(1/round(sqrt(n))^2, n= 1..infinity));
```

```
2.000000000
```

.....

Maple 9.5.1 >
```
evalf(Sum(1/n^2+(-1)^n/2^n, n= 1..infinity));
```

```
Sum(1/n^2+(-1)^n/(2^n),n = 1 .. infinity)
```

.....

Maple 9.5.1 >
```
evalf(Sum(1/2^n+(-1)^n/2^(n+1), n= 0..infinity));
```

```
Sum(1/(2^n)+(-1)^n/(2^(n+1)),n = 0 .. infinity)
```

.....

Maple 9.5.1 >
```
evalf(sum(round(arccot(n)), n= 1..infinity));
evalf(Sum(frac(n)^ln(n), n= 1..infinity));
```

```
> evalf(Sum(frac(n)^arccosh(n), n= 1..infinity));

Error, (in evalf/Sum1) Array index out of range
Error, (in evalf/Sum1) Array index out of range
Error, (in evalf/Sum1) Array index out of range
```

.....

```
Maple 9.5.1 > product(1+1/(0.33*n^2+5*n), n= 1..infinity);

Float(infinity)
```

.....

```
Maple 9.5.1 > product(i/(n-i), i= 1..n-1);

0
```

.....

```
Maple 9.5.1 > maximize(abs(tan(I+z)), z= 0..1);

f
```

.....

```
Maple 9.5.1 > maximize(sin(z)*arctan(z), z= 0..3);

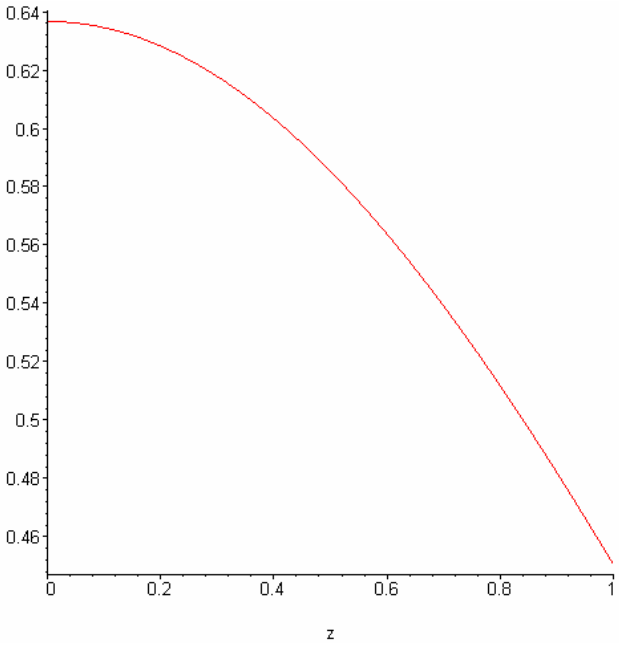
sin(3)*arctan(3)
```

.....

```
Maple 9.5.1 > maximize(BesselJ(1/2,z)^2/z, z= 0..1);

1/Pi*infinity
```

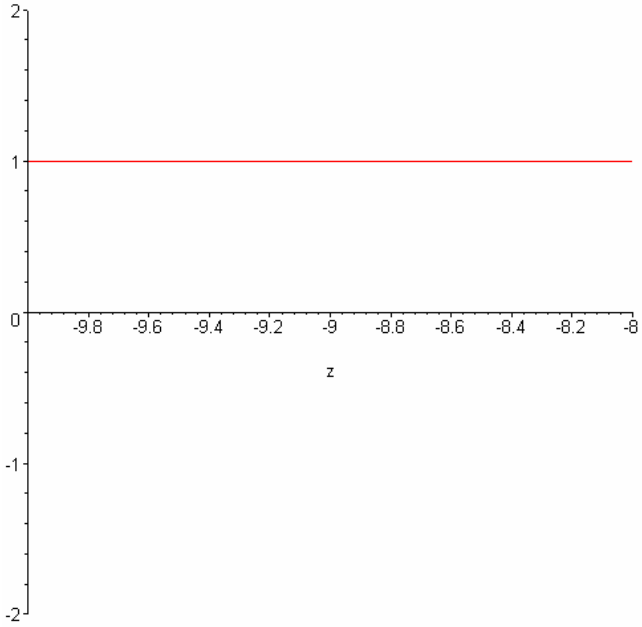
```
Maple 9.5.1 > plot(BesselJ(1/2,z)^2/z, z=0..1);
```



.....

Now let's draw a graph of a complex-valued function… without Re and Im… Maple couldn't have done it!?

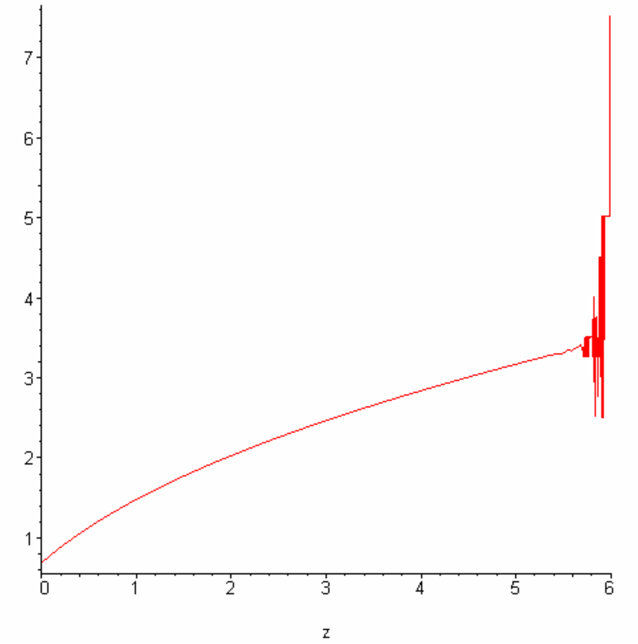
Maple 9.5.1 > **`plot(sqrt(1+z^z),z=-10..-8,-2..2);`**



There it is!

.....

Maple 9.5.1 > **`plot(HermiteH(1/2,z),z=0..6);`**



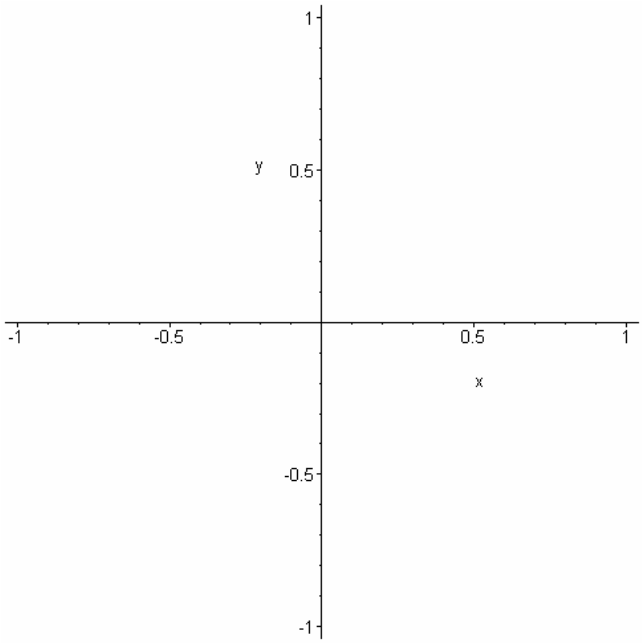
……………………………………………………………………………………………….

Maple 9.5.1 > `plot(1+z^z,z=-9..-8);`

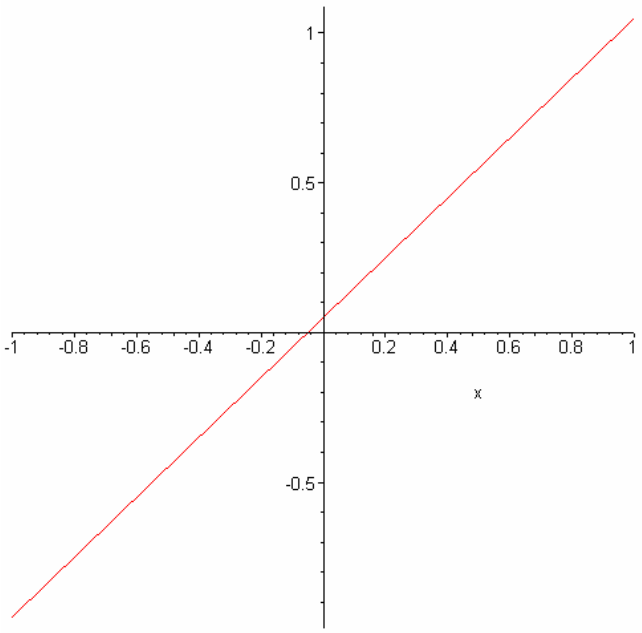
……………………………………………………………………………………………….

!!!
!!! NONE of Maple versions can draw this graph correctly !!!
!!!

Maple 9.5.1 > `implicitplot(ln(y-x)= -3, x= -1..1, y= -1..1);`

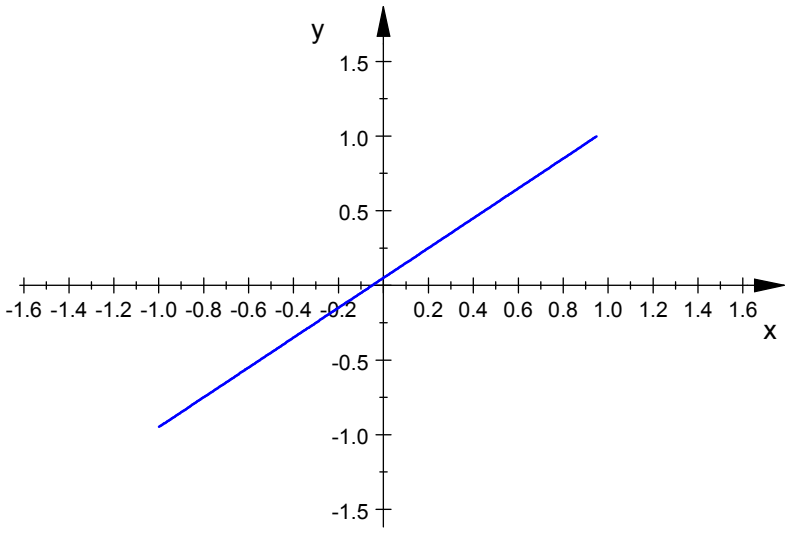


Maple 9.5.1 > **`plot(solve(ln(y-x)+3= 0, y), x= -1..1);`**



What about MuPAD 3.1 ?

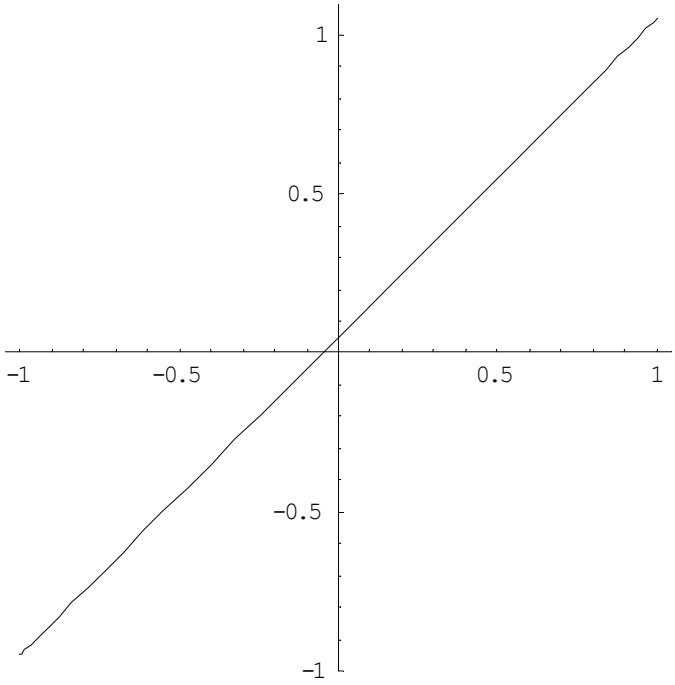
- `plot(plot::Implicit2d(ln(y-x)+3, x = -1..1, y = -1..1))`



What about Mathematica 5.0.1 ?

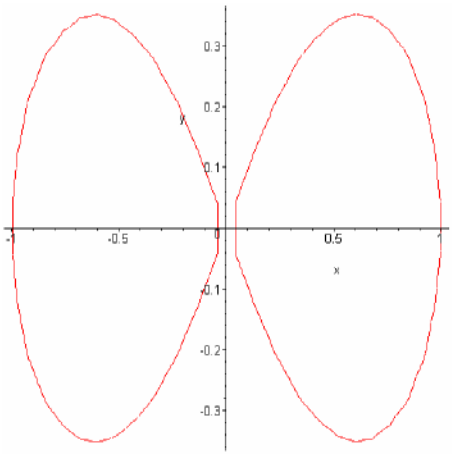
```
<<Graphics`ImplicitPlot`;

ImplicitPlot[Log[y-x]==-3,{x,-1,1}]
```



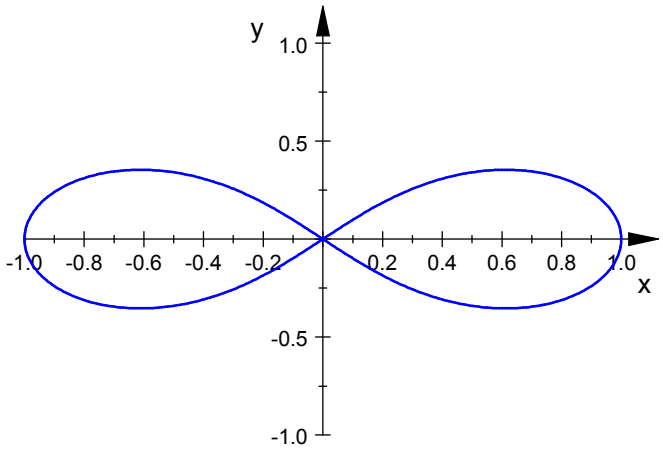
.....

Maple 9.5.1 >`implicitplot((x^2 + y^2)^2= x^2 - y^2, x=-1..1, y=-1..1);`



MuPAD 3.1 produces a perfect graph.

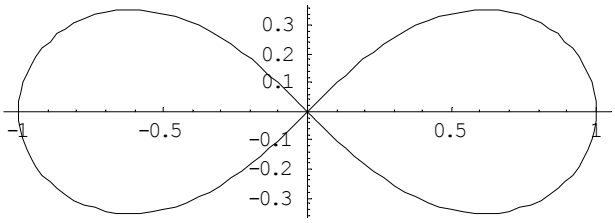
- `plot(plot::Implicit2d((x^2+y^2)^2=x^2-y^2, x = -1..1, y = -1..1))`



The same with Mathematica 5.0.1.

```
<<Graphics`ImplicitPlot`

 ImplicitPlot[(x^2+y^2)^2==x^2-y^2,{x,-1,1}]
```



.....

Maple 9.5.1 > **`simplify(((1/30)^I)^(1/I));`**

```
                1/30
```

.....

```
Maple 9.5.1 > expr := sqrt(sqrt(2)/16+1/8)*arctan((sqrt(2-sqrt(2))-sqrt(2)
              +1)/(sqrt(10-7*sqrt(2))+2*sqrt(2)-3))+sqrt(1/8-sqrt(2)/16)
              *arctan((sqrt(sqrt(2)+2)+sqrt(2)+1)/(sqrt(7*sqrt(2)+10)+2*
              sqrt(2)+3)):

              evalf(expr, 65);
              evalf(Pi*sqrt(2*sqrt(2)+20)/32, 65);

              simplify(expr);

              .46907024979060003129655502332032257488887851640080360643562837993
              .46907024979060003129655502332032257488887851640080360643562837991

              Error, (in rationalize) numeric exception: division by zero
```

.....

```
Maple 9.5.1 > assume(z>0); simplify((z^I)^(1/I));

              z
```

.....

```
Maple 9.5.1 > solve(1+(1+z^2)^(5/2)=0, z);

              Error, (in evala/Indep) argument should be an algebraic function field
```

.....

```
Maple 9.5.1 > dsolve(diff(y(z),z)+y(z)^2, y(z));

              y(z) = 1/(z+_C1)
```

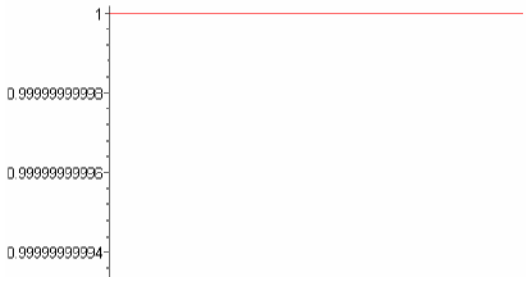
.....

How much you are able to see here? ;) The axes? A graph?

```
Maple 9.5.1 > plot(abs(Sum(exp(I*z), n=0..2)), z=0..1);
```

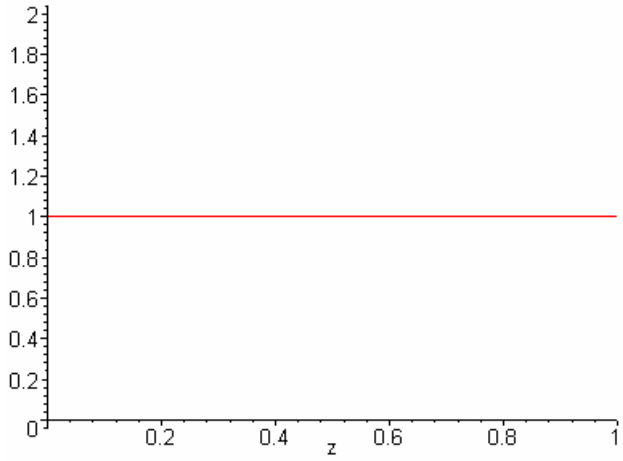
.....

Maple 9.5.1> `plot(abs((-1)^z), z=0..1);`



Compare with Maple V Release 5 of 1997

Maple V R 5> `plot(abs((-1)^z), z=0..1);`

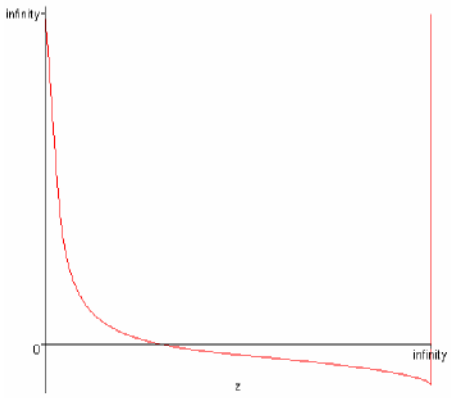


Maple 9.5.1 > **plot(exp(arcsech(z)), z= 0..46);**

```
Warning, unable to evaluate the function to numeric values in the region;
see the plotting command's help page to ensure the calling sequence is
correct

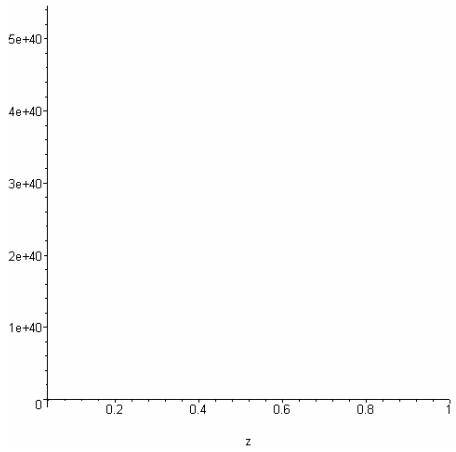
Plotting error, empty plot
```

Maple 9.5.1 > **plot((sqrt(1+2*z)-z)/z, z= 0..infinity);**



DESCRIPTION: Only Maple V Release 5 of 1997 and Maple V Release 3 of1994 draw this graph correctly.

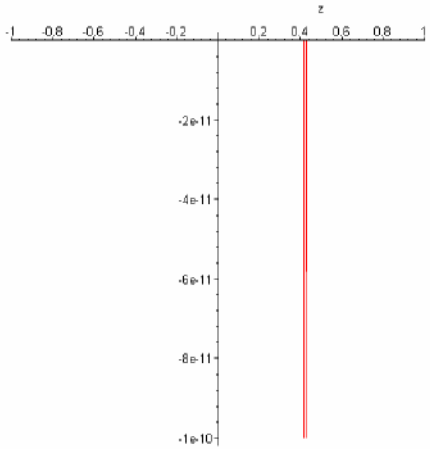
Maple 9.5.1 > **plot(AiryBi(1, 1/z), z= 1/27..1);**



EXPECTED: In Maple 9.5.1 the graph is also displayed.

.....

Maple 9.5.1 > **plot(abs(cos(z) + I*sin(z)) - 1, z= -1..1);**

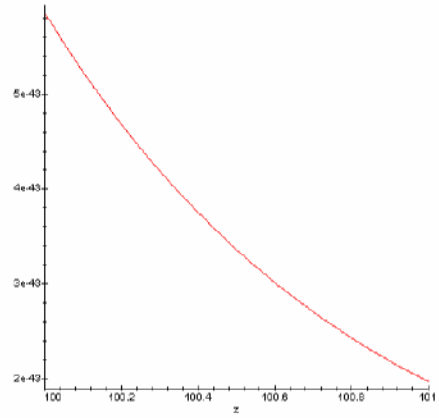


.....

Maple 9.5.1 (2004) > **plot(StruveH(1,z)/StruveL(2,z), z=100..101);**

Floating Point Overflow. Please shorten axes.

Maple V Release 4 (1995) > **plot(StruveH(1,z)/StruveL(2,z), z=100..101);**



.....

PLACE HERE 1000 Error, (in X) too many levels of recursion see ALL-BUG.txt

.....

Maple 9.5.1 > **evalf(int(GAMMA(1/3, ln(z)), z= 0..1));**
evalf(Int(GAMMA(1/3, ln(z)), z= 0..1));
evalf(Int(exp(arccos(z)-arccosh(z)), z= 0..1));
int(arctanh(sqrt(z)*arctan(z)), z= 0..1);
int(binomial(z,2*z), z= 1..infinity);

Error, (in series/GAMMA) too many levels of recursion
Error, (in series/GAMMA) too many levels of recursion
Error, (in ln) too many levels of recursion
Error, (in evalf/cos) too many levels of recursion
Error, (in depends/internal) too many levels of recursion

.....

Maple 9.5.1 > **int(z*AiryAi(sqrt(Psi(1/z))), z= 1..infinity);**

Error, (in series/leadterm) unable to compute leading term

.....

Maple 9.5.1 > **evalf(Int(arctanh(z)/ChebyshevU(0,z), z= 1..2));**

Error, (in evalf/int) invalid subscript selector

.....

Maple 9.5.1 > **int(floor(z-1/z), z=0..1);**

Error, (in assuming) when calling `limit`. Received: 'inconsistent direction with infinities'

.....

```
Maple 9.5.1 > int(1/(1-sqrt(z^3)), z= 0..1);

              Error, (in int/ellalg/elltype) numeric exception: division by zero
```

.....

```
Maple 9.5.1 > int(1/(1+z^2), z= 1..I*infinity,CauchyPrincipalValue);

              Error, (in Limit) Limit uses a 3rd argument, dir, which is missing
```

.....

```
Maple 9.5.1 > convert(MeijerG([[],[]],[[1],[]],1.0),StandardFunctions);

              Error, (in int/gsum) int/gsum uses a 4th argument, ds, which is missing
```

.....

Using innocent CauchyPrincipalValue option results in a spurious error message. Of cause, for a smooth integrand like here, with or without CauchyPrincipalValue we must have the same answer.

```
Maple 9.5.1 > int(1/(2+sin(z)), z= 0..infinity, CauchyPrincipalValue);

              Error, (in assuming) when calling `limit/range`. Received: 'should not
              happen 33'

               #   =  infinity
```

.....

```
Maple 9.5.1 > iscont(1/(1+z^2*arctan(z^2)), z= 0..1);

              Error, (in unknown) cannot handle multiple RootOfs
```

.....

```
Maple 9.5.1 > convert(abs(1+z*I), piecewise);

               Error, (in PiecewiseTools:-Convert) unable to compare -I and 0
```

.....

```
Maple 9.5.1 > restart;
              assume(a,complex, abs(a)=0);      # 1
              assume(a>=0);                     # 2
              assume(a,real, abs(a)=0);         # 3
```

but changing the order f the assumption, we see

```
Maple 9.5.1 > restart;
              assume(a>=0);                     # 2
              assume(a,real, abs(a)=0);         # 3
              assume(a,complex, abs(a)=0);      # 1

              Error, (in assume) cannot assume on a constant object
```

```
Maple 9.5.1 > assume(a>infinity); about(a);

Originally a, renamed a~:
     Involved in the following expressions with properties
     a-infinity assumed RealRange(Open(0),infinity)
     is assumed to be: real
     also used in the following assumed objects
     [a-infinity] assumed RealRange(Open(0),infinity)
```

```
Maple 9.5.1 > int(ln(z)/(1+z+z^2+z^3+z^4), z= 0..infinity);

Error, (in assuming) when calling `signum/main`. Received: 'numeric
exception: division by zero'
```

BUG # XXXXX	int (1-D): EXCEPTION IS NOT RAISED	
REGRESSION	YES	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	ABSENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	ABSENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	ABSENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	ABSENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	ABSENT*	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	ABSENT*	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

DESCRIPTION: Correctness of the input's syntax is not checked.

According to ?int,

"int or Int - Definite and Indefinite Integration
Calling Sequences
int(expr, x)
Int(expr, x)
int(expr, x=a..b, opt)
Int(expr, x=a..b, opt)

Parameters
expr - algebraic expression, the integrand
x - name
a,b - endpoints of interval on which integral is taken
opt - option, where opt is one of 'continuous', 'CauchyPrincipalValue', or 'AllSolutions'"

In other words, the user can apply only 3 options:

1) continuous
2) CauchyPrincipalValue
3) AllSolutions

EXPRESSION: int(z, z= 0..1, TotalBunk = true);
int(z, z= 0..1, TotalBunk);

ACTUAL: 1/2
1/2

EXPECTED: Error, (in int/check_syntax) Illegal argument TotalBunk = true
Error, (in int/check_syntax) Illegal argument TotalBunk

COMMENT: ABSENT* = Error, (in int) wrong number (or type) of arguments

.....

.....

Let us compare a simple integral calculation in Mathematica 5.0.1 and Maple 9.5.1.

```
$Version
```

```
5.0 for Microsoft Windows (November 18, 2003)
```

```
Integrate[Sqrt[1-Sin[z] Cos[z]], {z, 0, Pi}]
```

$$\frac{\text{EllipticE}\left[\frac{\pi}{4}, -2\right]}{\sqrt{2}} + \frac{\text{EllipticE}\left[\frac{3\pi}{4}, -2\right]}{\sqrt{2}}$$

```
%//N
```

```
3.08926 +0. i
```

```
NIntegrate[Sqrt[1-Sin[z] Cos[z]], {z, 0, Pi}]
```

3.08926

What about Maple 9.5.1 ?

http://www.maplesoft.com/products/maple/explore.shtml

Maple 9 is the premium software system for any activity that involves mathematics.

Maple 9.5.1 > `int(sqrt(1-sin(z)*cos(z)),z=0..Pi,continuous);`

```
-1/2*(-2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*EllipticE((\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-2*\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*EllipticE(((RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/\
2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4)^2-2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*((RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/(RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 2)^3*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)\
)^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*Elliptic\
E((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*R\
```

```
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^3-2*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2\
)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^4*((-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 2))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2))^(1/2)*EllipticF((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)\
-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2)))^(1/2))-4*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_ \
Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 2)^3*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/\
2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_ \
Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticPi((R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),(RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 4)),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2)))^(1/2))+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 4))^(1/2)*EllipticF(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))\
/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
```

```
_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^2-4*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)\
*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*((-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 3)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*Elliptic\
F(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)))^(1/2)-4*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2)*EllipticF(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))\
^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2\
)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)\
-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 3)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-4*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 4)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*EllipticPi(((RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4)))^(1/2),(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)),((RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1\
/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2)-2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2-2*(RootOf(1-2*_Z+2*_Z\
```

```
^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*EllipticF(\
((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 3)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^2+\
2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^2*RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 2))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))\
^(1/2)*EllipticE((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2\
),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(\
1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^2-2*RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^3*(-\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*((-RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)\
)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2))^(1/2)*EllipticE((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 2))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)/(Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(\
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RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 2)))^(1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-4*Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)\
)^(1/2)*EllipticPi(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 4)),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))\
/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))\
^(1/2)+2*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2)^2-4*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 2)^2*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2\
))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*Ellipti\
cPi((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),(RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)\
)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2)))^(1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-4*\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 4)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)\
*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*((RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticF((RootOf(1-2*_Z+2*_Z^\
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2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))+4*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*\
(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 4)*EllipticPi((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)\
))^(1/2),(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1)+4*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 4))^(1/2)*EllipticPi(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
4)))^(1/2),(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)),((RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1)))^(1/2)+4*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
4)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 4))^(1/2)*EllipticPi(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2),(RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)),(-(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-\
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RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*\
((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
1)))^(1/2)+4*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2\
)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^3*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 3)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 2))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*EllipticPi((Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)\
-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 2)),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 4)))^(1/2))+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 4)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^\
(1/2)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*(RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticE\
((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3\
))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
4)-(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^2+4*RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^3*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
```

```
x = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/\
2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticPi(((\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/(RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2),(RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 4)),(-(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4)))^(1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-2*RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(\
1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4)))^(1/2)*EllipticF(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)\
-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))\
*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 4)-2*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 2)^2*EllipticF(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^\
(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)\
))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 3)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)+4*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*Root\
```

```
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*EllipticF(((RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)\
)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*(\
(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)+2*RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*Ellipti\
cE(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)\
*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)^2+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 2)^2+2*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2+2*Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)-2*(RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)-2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
```

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index = 1)^2*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)-2*(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*EllipticE((\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)\
)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)\
*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 2)-3*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))\
^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+4*RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 2)^2*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*((\
-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*((RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))\
*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticPi(((RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2),(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)),((Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))+\
```

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2*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/(RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 2)^3*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)\
*EllipticF((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1\
)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^2+4*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*(RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*(-RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 3)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2))^(1/2)*EllipticF((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1\
)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 4)))^(1/2))+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*((RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 2)^2*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^\
(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticF(\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)\
)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
```

```
ex = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 4))^(1/2)*EllipticE(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)\
))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 3)+4*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)\
))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^3*(-RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 3)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)\
+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2))^(1/2)*EllipticF((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 4)))^(1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-2*Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 2))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^3*(\
(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*((RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)\
)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticF((RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+\
```

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2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 2)^3*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*((\
-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*((RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))\
*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticE((RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)+2*(RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 4))^(1/2)*EllipticE(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),(\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2\
))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 3)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^\
2-2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^2*RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2+2*Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2)+4*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2\
)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*Ellip\
ticF(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2),(-(RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2))*((RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z\
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^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 4)-4*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^3*RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))\
)^(1/2)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*(-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticF((RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2))-2*RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^\
(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*(-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 3)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 2))^(1/2)*EllipticF((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 4)))^(1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)^2+4*RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1\
/2)*EllipticPi(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2),(RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))\
/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 2)),(-(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 4)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
```

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ex = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1\
/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-4*RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 4)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 4))^(1/2)*EllipticPi(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
)))^(1/2),(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)))^(1/2)-4*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_ \
Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*(-RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 2))^(1/2)*EllipticPi((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_ \
Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4)))^(1/2),(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)),((RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2))*RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2-2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2)^2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2\
)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 2))^(1/2)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)\
*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2))^(1/2)*EllipticE((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*\
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_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))\
^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2\
)))^(1/2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)+2*(RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*Ellip\
ticF(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 1)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)-2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2*(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 2))^(1/2)*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*(RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 4))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(\
1/2)*EllipticE((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),(\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2\
))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4)^2+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*(Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 4))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/\
2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*EllipticF(((RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
```

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^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)\
-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 4)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*(RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4))^(1/2)*EllipticE(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1\
/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))\
^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 3)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)-4*RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)\
*EllipticPi(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2\
*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2),(RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(R\
ootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2)),(-(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 4)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2\
+2*_Z^3+_Z^4,index = 3)))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)\
*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+4*RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)*(RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4))^(1/2)*EllipticPi(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))\
^(1/2),(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 1)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index \
= 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((-RootOf(1-2*_Z\
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+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1\
))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 4)))^(1/2)+2*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^\
3*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2*((RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 2))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index\
= 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)\
*EllipticE(((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2),(-(Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2))+\
(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 3)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^2-2*RootOf(1-2*_Z+2*\
_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)^2\
*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3\
+_Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_\
Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)*EllipticE(((RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/(Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 2)))^(1/2))*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4\
,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 3)))^(1/2)*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1\
/2)+2*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+\
2*_Z^3+_Z^4,index = 2))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)/(Root\
Of(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,\
index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*RootOf(1-2\
*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)^4*((-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 3)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z\
^4,index = 2))^(1/2)*((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 1))/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(\
1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)*EllipticF((RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2\
)*(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^\
3+_Z^4,index = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-\
2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2),((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+\
```

```
_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3))*(RootOf(1-2*\
_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 3))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)))^(1/2))-4*(RootOf(1-2*_Z+2*_Z^2+2*\
_Z^3+_Z^4,index = 1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(\
1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,ind\
ex = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 4)))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
2)^3*(-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*(-RootOf(1-2*_Z+2*_Z^\
2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/Roo\
tOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^\
4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)))^(1/2)*((RootOf\
(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 1))*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)/(RootOf(1-2*_Z+2*_Z\
^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/Ro\
otOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))^(1/2)*RootOf(1-2*_Z+2*_Z^2+2*_\
Z^3+_Z^4,index = 4)*EllipticPi((RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = \
1)/RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*(RootOf(1-2*_Z+2*_Z^2+2*_Z\
^3+_Z^4,index = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))/(RootOf(1\
-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,inde\
x = 4)))^(1/2),(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)-RootOf(1-2*_Z\
+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index =\
4)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)),((RootOf(1-2*_Z+2*_Z^2+2\
*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2))*(RootO\
f(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,i\
ndex = 4))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 1))/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)-\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4)))^(1/2)))/(-RootOf(1-2*_Z+2*_\
Z^2+2*_Z^3+_Z^4,index = 2)+RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 1))/(\
RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 2)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_\
Z^4,index = 1)*RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 3)*RootOf(1-2*_Z+\
2*_Z^2+2*_Z^3+_Z^4,index = 4))^(1/2)/(RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,in\
dex = 2)-RootOf(1-2*_Z+2*_Z^2+2*_Z^3+_Z^4,index = 4))
```

On top of it , this human unreadable answer is is mathematically invalid.

Maple 9.5.1 > **evalf(%);**

```
Float(-infinity)-Float(infinity)*I
```

Maple 9.5.1 > **evalf(Int(sqrt(1-sin(z)*cos(z)),z=0..Pi));**

```
3.089262048
```

……

$Version

5.0 for Microsoft Windows (November 18, 2003)

Integrate[1/(z^52+z^49-z^29-z^26-z^23+z^3+1),{z,0,1}]//Timing

{3.726 Second, RootSum[1 + #1^3 - #1^23 - #1^26 - #1^29 + #1^49 + #1^52 & , Log[1 - #1]/(3*#1^2 –23 *#1^22 - 26*#1^25 - 29*#1^28 + 49*#1^48 + 52*#1^51) &] - RootSum[1 + #1^3 - #1^23 - #1^26 - #1^29 + #1^49 + #1^52 & , Log[-#1]/(3*#1^2 - 23*#1^22 - 26*#1^25 - 29*#1^28 + 49*#1^48 + 52*#1^51) &]}

%//N

{3.715 Second,0.871626 +0. i}

```
NIntegrate[1/(z^52+z^49-(z^29)-(z^26)-(z^23)+z^3+1),{z,0,1}]

0.871626
```

.....

http://www.maplesoft.com/corporate/

A list of key commercial customers includes Toyota, Sun Microsystems, Hewlett Packard, Boeing, Raytheon, Allied Signal, Motorola, Robert Bosch, General Electric, Lucent Technologies, Daimler-Chrysler and Ford.

…poor things!... [VB]

http://www.maplesoft.com/pressroom/releases/2004/2004-11-02.shtml

Laurent Bernardin, Vice President of R&D:

Over 3 million mathematicians, scientists and engineers world-wide use our software today.

It is sad and frustrating to hear that the students are not mentioned by Maplesoft's Vice President. Such is the vision of a person who influences the company's long-term decisions.

Or the things are even darker, Mr Bernardin equals a math fresh or sophomore to a mathematician?

If this is just a lapse, I find it to be symptomatic. An example came uppermost, if you do not trust the author, run Maple 9.5.1 Standard worksheets and always work using them.

http://www.maplesoft.com/pressroom/releases/2004/2004-11-02.shtml

Over 5 million users benefit from advanced Maple technology.

Maria Bo
Maplesoft
Phone: 519.747.2373 ext. 289
E- mail: mbo@maplesoft.com

Dear Maria Bo and Maplesoft's top officers, — aren't we not users but *customers? Don't you enjoy nice life because we pay you?*

Intended Readership

This Review is for everybody who wants, fighing against Maple bugs to learn much more about these bugs than Maplesoft will ever report you.

The Review is designed for R&D staff using symbolic/hybrid calculations, math instructors, math-related students, Maple experts, decision makers, financial analysts of the symbolic software market, software testers, and software architects, and math software manufactures.

If your plans depend essentially on using Maplesoft products, if you have already invested time/money into Maple or you are going to do so, this Review might be of significant or possibly even critical value for you because it deals with stability/math correctness/limitations and the future of Maple.

If you a math amateur or are just looking for a piece of math entertainment, this Review might be of help for you, too. Remember, how some Pierre F. earned his living? ;-)

Cyber Tester's Visitors

Cyber Tester's visitors are from

Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kyrgzstan, Latvia, Lebanon, Lithuania, Luxembourg, Macedonia, Malaysia, Maldives, Mexico, Moldova, Morocco, Netherlands, New Zealand, Nigeria, Niue, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Singapore, Slovakia, Slovenia, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, Ukraine, United Arab Emirates, United States, Uruguay, Uzbekistan, Venezuela, Viet Nam.

86 countries, totally, as of December 7, 2004.

Foreword For Impatient Readers

1) Drop all your current activity and go quickly to Maple Bugs Encyclopaedia http://maple.bug-list.org/

2) Don't wait until the entry page is loaded, - click, impatiently, the *Go* button on the top.

3) Glance you eye down the Maple bug entry, remembering about the *Show details* feature.

4) Select other search parameters, and click hungeringly the *Go* button.

5) Realize that a string of major Maple Bugs Encyclopaedia upgrades is coming!

Foreword For Regular Readers

If you are reading this text, probably you share with the author a belief that…

Do you want to have a clever math assistant at your fingertips which can produce results absent in Prudnikov-Brychkov-Marichev […] and cannot be calculated by any current computer algebra system? Say, something like Bondarenko[…]

Maple 11 > **sum(Ci(Pi*(1+2*n))-Ci(2*Pi*(1+2*n)), n= 0..infinity);**

```
1/8
```

Maple 11 > **sum((-1)^(1+n)*hypergeom([1/2, 1+n/4],[2+n/4],-1)/(n*(4+n)), n= 1..infinity);**

```
1/2*ln(2)*2^(1/2)-1/8*(2+4*I-(1+2*I)*2^(1/2)-4*I*2^(1/2)*EllipticE((1-I)^(1/2),
1/2*2^(1/2))+(2+2*I)*(-I+2^(1/2))*EllipticF((1-I)^(1/2),1/2*2^(1/2))+4*I*
EllipticPi((1-I)^(1/2),1/2-1/2*I,1/2*2^(1/2))-4*2^(1/2)*EllipticPi((1-I)^(1/2),
-1/2*2^(1/2)+1,1/2*2^(1/2))+2*((-2+2*I)*(1+2^(1/2))*EllipticE(2/(2*2^(1/2)+
4)^(1/2),1/2*2^(1/2))-(2+2*I+(1+2*I)*2^(1/2))*EllipticF(2/(2*2^(1/2)+4)^(1/2),
1/2*2^(1/2))+(1-I)*(2+2^(1/2))*EllipticPi(2/(2*2^(1/2)+4)^(1/2),1/2-1/2*I,
1/2*2^(1/2))+(2+2*I)*(1+2^(1/2))*EllipticPi(2/(2*2^(1/2)+4)^(1/2),-1/2*2^(1/2)
+1,1/2*2^(1/2)))*RootOf(1+34*_Z^2+_Z^4,index = 3)^(1/2))*2^(1/2)
```

Maple 11 > **sum((-1)^n*LerchPhi(-1,1,1+2*n)/(n*(2*n-1)), n= 1..infinity);**

```
-1/48*Pi^2+1/4*Pi*(-2+ln(2))+1/4*ln(2)*(4+ln(8))
```

Maple 11 > **sum((-1)^(n+1)/n*((-1)^(2/3)*hypergeom([1+2*n, 1],[2*n+2],-(-1)^(1/3))-hypergeom([1+2*n, 1],[2*n+2],(-1)^(2/3)))/(-2+(-1)^(1/3))/(1+2*n), n= 1..infinity);**

```
(-1)^(1/6)*(Pi*(ln(256)+6*ln(2+sqrt(3)))-24*I*(polylog(2,1-1/2*I-1/2*sqrt(3))-
polylog(2,1+1/2*I-1/2*sqrt(3))+polylog(2,(-1/4-1/4*I)*(-2-I+sqrt(3)))-polylog(2,(-
1/4+1/4*I)*(-2+I+sqrt(3)))+polylog(2,2/(2-I+sqrt(3)))-polylog(2,
(2+2*I)/(2-I+sqrt(3)))-polylog(2,2/(2+I+sqrt(3)))+polylog(2,(2-2*I)/(2+I+sqrt
(3)))))/(24+24*(-1)^(1/3))
```

Maple 11 > **simplify(dilog(2+2*I)-dilog(2-2*I)+dilog(8/5+4/5*I)-dilog(1/5+3/5*I));**

```
Pi*arctan(1/3)/2 - 3*Pi^2/16 - I*(Pi*ln(5)/4 + Catalan)
```

Maple 11 > **1/2*sum((-1)^n*(Pi-2*(n+1)*(1-1/(n+1))*hypergeom([1, 1/2],[3/2],-(n+1)^2*(1-1/(n+1))^2)), n= 0..infinity);**

```
1/2*Pi+sum((-1)^n*arctan(1/n), n = 1 .. infinity)
```

Maple 11 > **sum((Psi(1+n)+Psi(3/2+n))/GAMMA(2+2*n), n= 0..infinity);**

```
(Ei(1)+ln(2)-exp(2)*(Ei(-1)+ln(2)))*exp(-1)
```

Maple 11 > **int((2*cos(z)*Zeta(3)-polylog(3,exp(-I*z))-polylog(3,exp(I*z)))/z^2,z = 0 .. infinity);**

```
1/6*Pi*(Pi^2-6*Zeta(3))
```

Maple 11 > **int(RootOf(-erf(_Z)+sqrt(z)), z= 0..1);**

```
sqrt(2/Pi)
```

Maple 11 > **int(StruveL(1,2*sqrt(RootOf(-erf(_Z)+z)))/RootOf(-erf(_Z)+z), z= 0..1);**

```
8/3*hypergeom([1/2, 1],[3/4, 5/4, 5/4, 7/4],1/16)/Pi+32/45*hypergeom([1,
1],[5/4, 7/4, 7/4, 9/4],1/16)/Pi^(3/2)
```

Maple 11 > **int(z*csc(z)*(-2*cot(z)*csc(z)+Pi*coth(Pi*tan(z))*csc(z)+Pi^2*csch(Pi*tan(z))^2*sec(z)), z= 0..Pi/2);**

```
Pi
```

More examples?

Return-Path: <oleg@wolfram.com>
Received: from wolfram.com (wri-dns0.wolfram.com [140.177.205.10])
by strace.net (8.10.2/8.10.2) with ESMTP id fA2I0bI13682
for <vvb@mail.strace.net>; Fri, 2 Nov 2001 20:00:38 +0200
Received: from wolfram.com (discovery2.wolfram.com [140.177.4.27])
by wolfram.com (8.11.2/8.11.2) with ESMTP id fA2I0Uw15820
for <vvb@mail.strace.net>; Fri, 2 Nov 2001 12:00:31 -0600
Sender: oleg@wolfram.com
Message-ID: <3BE2DF10.5F584212@wolfram.com>
Date: Fri, 02 Nov 2001 11:59:44 -0600
From: Oleg Marichev <oleg@wolfram.com>
X-Mailer: Mozilla 4.76 [en] (X11; U; Linux 2.4.2-2 i686)
X-Accept-Language: en
MIME-Version: 1.0
To: Vladimir Bondarenko <vvb@mail.strace.net>
Subject: Re: My corrections?
References: <2618978867.20011102012714@mail.strace.net>
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-UIDL: ;_Y!!/Y;!!;$p!!C85!!

Vladimir,

[…]

You samples of definite integrals I will implement in the site also later on.

[…]

Oleg

$$\int_0^1 \frac{1-e^{-\mathrm{erf}^{-1}(0,z)}}{\mathrm{erf}^{-1}(0,z)}\,dz = -\frac{-2\pi\,\mathrm{erfi}\left(\frac{1}{2}\right)+{}_2F_2\left(1,1;\frac{3}{2},2;\frac{1}{4}\right)}{2\sqrt{\pi}}$$

$$\int_0^1 \frac{\mathrm{erf}^{-1}(0,z)^2-\mathrm{erf}^{-1}(0,z)}{(\mathrm{erf}^{-1}(0,z)+1)^3}\,dz = 2-\frac{3\sqrt{\pi}\,\mathrm{erfi}(1)}{e}+\frac{3\,\mathrm{Ei}(1)}{e\sqrt{\pi}}$$

$$\int_0^1 \mathrm{erf}^{-1}(0,z)\,dz = \frac{1}{\sqrt{\pi}}$$

$$\int_0^1 \frac{\sin\left(\sqrt{a^2\,\mathrm{erf}^{-1}(0,z)}\right)}{\sqrt{a^2\,\mathrm{erf}^{-1}(0,z)}}\,dz = \frac{\sqrt{\pi}\;{}_0F_2\left(;\frac{3}{4},\frac{5}{4};\frac{a^4}{256}\right)-\frac{1}{6}a^2\,{}_1F_3\left(1;\frac{5}{4},\frac{3}{2},\frac{7}{4};\frac{a^4}{256}\right)}{\sqrt{\pi}}$$

$$\int_0^1 {}_0F_2\left(;1,1;-a\,\mathrm{erf}^{-1}(0,z)\right)dz = {}_0F_4\left(;\frac{1}{2},\frac{1}{2},1,1;\frac{a^2}{64}\right)-\frac{a\,{}_0F_4\left(;1,\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{a^2}{64}\right)}{\sqrt{\pi}}$$

$$\int_0^1 J_0\left(a\sqrt{\mathrm{erf}^{-1}(0,z)}\right)dz = {}_0F_2\left(;\frac{1}{2},1;\frac{a^4}{256}\right)-\frac{a^2\,{}_0F_2\left(;\frac{3}{2},\frac{3}{2};\frac{a^4}{256}\right)}{4\sqrt{\pi}}$$

$$\int_0^1 \frac{dz}{a\,\mathrm{erf}^{-1}(0,z)+1} = \frac{e^{-\frac{1}{a^2}}\left(\sqrt{-\frac{1}{a^2}}\;a\pi\,\mathrm{erfc}\left(\sqrt{-\frac{1}{a^2}}\right)+E_1\left(-\frac{1}{a^2}\right)\right)}{a\sqrt{\pi}}$$

$$\int_0^1 e^{-a\,\mathrm{erf}^{-1}(0,z)}\,dz = e^{\frac{a^2}{4}}\,\mathrm{erfc}\left(\frac{a}{2}\right)$$

$$\int_0^1 \log\left(\mathrm{erf}^{-1}(0,z)\right)dz = -\frac{\gamma}{2}-\log(2)$$

$$\int_0^1 \mathrm{erf}^{-1}\left(0,\sqrt{z}\right)dz = \sqrt{\frac{2}{\pi}}$$

$$\int_0^1 \frac{e^{\text{erf}^{-1}(0,z)}\,\text{erf}\left(\sqrt{\text{erf}^{-1}(0,z)}\right)}{\sqrt{\text{erf}^{-1}(0,z)}}\,dz = \frac{2\,{}_2F_2\left(\frac{1}{2},1;\frac{3}{4},\frac{5}{4};\frac{1}{4}\right)}{\sqrt{\pi}} + \frac{4\,{}_2F_2\left(1,1;\frac{5}{4},\frac{7}{4};\frac{1}{4}\right)}{3\pi}$$

$$\int_0^1 \frac{\text{Li}_1\left(2\sqrt{\text{erf}^{-1}(0,z)}\right)}{\text{erf}^{-1}(0,z)}\,dz = \frac{8\,{}_2F_4\left(\frac{1}{2},1;\frac{3}{4},\frac{5}{4},\frac{5}{4},\frac{7}{4};\frac{1}{16}\right)}{3\pi} + \frac{32\,{}_2F_4\left(1,1;\frac{5}{4},\frac{7}{4},\frac{7}{4},\frac{9}{4};\frac{1}{16}\right)}{45\,\pi^{3/2}}$$

$$\int_0^1 {}_1F_1\left(1;\frac{1}{3};\text{erf}^{-1}(0,z)\right)dz = {}_2F_2\left(\frac{1}{2},1;\frac{1}{6},\frac{2}{3};\frac{1}{4}\right) + \frac{3\,{}_2F_2\left(1,1;\frac{2}{3},\frac{7}{6};\frac{1}{4}\right)}{\sqrt{\pi}}$$

$$\int_0^1 e^{\frac{\text{erf}^{-1}(0,z)}{e}}\,dz = e^{\frac{1}{4e^2}} + \frac{{}_1F_1\left(1;\frac{3}{2};\frac{1}{4e^2}\right)}{e\sqrt{\pi}}$$

$$\int_0^\infty \frac{2\,\zeta(3)\cos(z) - \text{Li}_3(e^{-iz}) - \text{Li}_3(e^{iz})}{z^2}\,dz = \frac{1}{6}\,\pi\left(\pi^2 - 6\,\zeta(3)\right)$$

$$\int_0^1 \log(z)\,E(z)\,dz = \frac{2}{9}\,(-16+3\pi)$$

$$\int_0^1 \log(z)\,K(z)\,dz = 2\pi - 8$$

$$\int_0^{\frac{\pi}{2}} z\csc(z)\left(\pi^2\sec(z)\,\text{csch}^2(\pi\tan(z)) - 2\cot(z)\csc(z) + \pi\coth(\pi\tan(z))\csc(z)\right)dz = \pi$$

Or imagine. You unexpectedly found yourself in a nice jet… Bin Ladin is imprisoned (or convicted of sins) Blonde jobs the air-hostess... Out of the blue, the jet starting nosing down… You still have time to drop the last sms message to your spouse, Don't wait me for the inner. The last thing you are observing is a nice proud plaque screwed down to the airframe, stating, *Engineered with Maple 10…*

Okay, let's stop all these wild nightmares.

Have you dreamt ever to become an intelligent officer (not a surrealistic 007 who runs and jumps over the roofs,) but a regular humble

Can *you* (not me, not Maplesoft's QA staff) test Maple efficiently, can *you*, a Maple potential customer, estimate its quality without almost lifting a finger?

- Castle-building… - I am hearing your wistful dictum.

- Live reality, - cheerfully claim me. But please be patient. Let the author to deploy his ideas as this should be done duly.

In a "bear" tech spending market, how can Maplesoft maximize its profits, still producing a comparatively reliable environment?

Should the Mapesoft move forward along the same line keeping a large enough QA stuff to guarantee certain (high enough) quality of Maple? Certainly, since times of Gaston Gonnet, such an approach worked over years, however, in the near future the climate is going to change itself dramatically and what's in store for Maplesoft? How one can reduce the overhead expenses while satisfying the corporate and individual users demands, and is this goal feasible at all?

Manual software testing, in general, and semi-automated generation of test data, in particular, are labor-intensive processes - not the most cost efficient at that.

Can automated testing significantly reduce the cost of software development & maintenance, or to proceed along this track is a nice yet dangerous mirage? What automated testing ideas could be successful in testing Maple? How expensive, how resource consuming is an automated testing process providing a reasonable control over Maple development? Can one identify subtle bugs using automated adaptive testing?

Can one efficiently generate, via a certain unified approach, such errors al follows (and many more types of them)?

```
Error, (in assuming) when calling `limit`. Received: 'invalid limiting point'
Error, (in limit) inconsistent direction with infinities
Error, (in evala/Divide/preproc) invalid arguments to divide: -Pi, Pi
Error, (in limit/mrv/limsimpl) too many levels of recursion
Error, (in signum/main) numeric exception: division by zero
Error, wrong number (or type) of parameters in function diff
Error, (in limit/range) should not happen 33
Error, (in is/allunique) too many levels of recursion
Error, (in int/lnpwr) too many levels of recursion
Error, (in limit/range) invalid terms in sum
Error, (in gcd/doit) too many levels of recursion
Error, (in int/definite/contour/polypow) numeric exception: division by zero

Execution stopped: Memory allocation failed.
The kernel has been shut down.
Further computations cannot be performed.
```

(For detail, see http://www.cas-testing.org/index.php?list=2)

Next, can we efficiently test graphics automatically? What about network aspects of Maple automated testing? Can the described approach be reinforced?

What will be the outcome of the Maplesoft crisis?

Foreword For Math Instructors

Enliven your classroom with Maple bugs!

[10] Reza O. Abbasian, Adrian Ionescu, Case Studies In The Shortcomings Of Maple In Teaching Undergraduate Mathematics

Foreword For Maple Experts

We lick our lips in expectation of many nice ideas which will undoubtly come to your ingenious minds during reading our data.

Add Alec Mihailovs' viewpoint

Foreword For Math Environment Manufacturers

A long pillar, compressed by forces applied at the ends in the direction of the axis, becomes unstable as regards flexure when the forces exceed a certain value
CT - EULER - STRENGTH OF MATERIALS

Foreword For Software Testers

Euler - Iron bar bent by supporting at one end, the other end being loaded;

Regression bug

DEFINITION.

RJF angry comment

Recurring bugs - definition

User's viewpoint is used systematically (bug, comparison with competitors)

You are one of the keystones on which your company is built. You are like Roman geese warning about a dander, you are paid your company survive. Nowadays, in presence of Internet (read, free and instant news propagation) and keen competition, it seems to be too academics not to take into account the competitors' products quality. Thus, if your competitor can make *A*, and your product cannot, and this *A* is o importance for the customers, your vital task is to get across this fact to your superiors.
How to support your company during environment development and analysis?

Automated Tools for quality measuring

http://www.cyfronet.krakow.pl/iccs2004/workshops_details.html

Tools for Program Development and Analysis in Computational Science

The use of supercomputing technology, parallel and distributed processing, and sophisticated algorithms is of major importance for computational scientists. Yet, the scientists' goals are to solve the challenging problems, not the software engineering tasks associated with it. For that reason, computational science and engineering must be able to rely on dedicated support from program development and analysis tools. Focusing on this background, the following question must be investigated: How to support users of computational science and engineering during program development and analysis?
In order to answer this question, paper submissions concerning the usage and application of software tools, and the demonstration of program development and analysis tools for computational scientists are invited. Authors are expected to

highlight the benefits of their tools for the users, and the improvements being expected when using them during software development.
This session offers the possibility to discuss tools and tool characteristics with those people that are using them for solving their scientific problems. Tool developers are able to show their products (or research prototypes) to potential users, while users can pose their request to tool developers.

Foreword For James Cooper

At this point I do not know if I will have any comments from you, but, honest and resourceful

http://www.cas-testing.org/index.php?list=7

I am open to any ideas, I am interested in helping

COMMENT 1 Albert D. Rich www.derive.com www.mulisp.com

COMMENT 2 Prof Dr Oleg Marichev (WRI) www.functions.wolfram.com

COMMENT 3 Dr Anwar (Andy) Shiekh (WRI) Test Development Group Supervisor

COMMENT 4 Prof Dr Walter Oevel (SciFace GmbH) http://www.math.uni-paderborn.de/~walter/

COMMENT 5 Dr Anwar (Andy) Shiekh (WRI) Test Development Group Supervisor

COMMENT 6 Dr Anwar (Andy) Shiekh (WRI) Test Development Group Supervisor

COMMENT 7 Dr Anwar (Andy) Shiekh (WRI) Test Development Group Supervisor

COMMENT 8 Dr Michael Wester www.math.unm.edu/~wester

COMMENT 9 Dr Anwar (Andy) Shiekh (WRI) Test Development Group Supervisor

COMMENT 10 Dr Anwar (Andy) Shiekh (WRI) Test Development Group Supervisor

COMMENT 11 Stefan Wehmeier (SciFace GmbH) http://www-math.uni-paderborn.de/~stefanw/

COMMENT 12 Dr Anwar (Andy) Shiekh (WRI) Test Development Group Supervisor

COMMENT 13 Kelly Roach http://home.att.net/~themission/

COMMENT 14 Dr Anwar (Andy) Shiekh (WRI) Test Development Group Supervisor

Foreword For Laurent Bernardin

My machine sees your efforts. With especial pleasure we see that quite a many bugs we had reported to Maplesoft via has already been fixed.

I also realize that you realized the meaning of what I had offered; but it was not you who was the decision maker but Michael Seymour, VP Operations.

Foreword For Critics

Without you, this memoir will never be as useful as it is intended to be! Critics of any kind is accepted with gratitude. No objection against personal assaults, anger, gnarling, grunting, castigation, as well as indiscriminate slaughter. Dour silence is also acceptable.

Especially much the author would be pleased to hear public critics of our Review from Maplesoft, if any.

If you would like to point out that such and such behaviour of Maple is a feature and not a bug please be sure that 111111111111111

One of the most tempting directions for critics, especially for a person, whoever Maple proficient, who does not earn his living as a professional quality assurance engineer, is to declare, nothing doubting, that actually the Maple Bugs Encyclopaedia holds (much) lesser distinct bug manifestations as compared with its current counter value

This is a subtle, non-trivial point, and while the minimization of the Maple Bugs Encyclopaedia entries still is not finished, and even more, currently, there are, alsmost for certain, duplicate Maple bug entries, we have a string of arguments explaining why generally the opinion of such a critic is completely false. For the time being, it would suffice to just remarks shortly that if all is so nice, then why Maple-related complaints got so hot during the 2 last years (see the selected opinions below, a small fraction of the actual ones)? Why, had there could be so many a duplicate, allegedly, in the Encyclpaedia, only a very limited number of Maple bugs has been fixed by Maplesoft?

Is this beta draft of the Review perfect? No way - far from it. :) Nonetheless, we found it to be useful and hope others will too. The draft you are reading is currently considered in a "beta beta" stage, so if you find anything worthwile to criticise, please let us know.

What you are seeing now here is just the very beginning. However, our hope is that you will not postpone your responses until the final version of this Review is ready. Please don't hesitate a second to send your comments to vb@cybertester.com .

To save efforts some most zealous critics, let the author assure you that we know Richardson's results,

For fans of manual lynching: though it is long since the author did his morning exercises for the last time, we still retain tangible thews, which we cannot help resisting temptation to boast via an immortal picture of Barry Simon

Foreword For Software Historians

Personal and social motives are intertwined.

Competition of engineering ideas are an integral part of human history.
~~Highly~~ inspired by Stephen Wolfram's idea, I considered to be the best choice, of publishing a complete memoir rather than a ton of nice papers to be scattered and unreadable in their dissipation … of I am running the risk of publishing these blatantly raw quick beta release because… Feynman
According to NIST, economical losses 59.5 billion annually

Unique opportunity to see author's creative lab "as is", without paint.

Foreword For CAS Architects

-- Martin Braun, Differential Equations And Their Application:

On July 1, 1940, the Tacoma Narrow Bridge at Puget Sound in the state of Washington was completed and opened to traffic. From the day of its opening the bridge began undergoing vertical oscillations, and it soon was nicknamed "Galloping Gertie." Strange as it may seem, traffic on the bridge increased tremendously as a result of its novel behavior. People came from hundreds of miles in their cars to enjoy the curious thrill of riding over a galloping, rolling bridge. For four months, the bridge did a thriving business. As each day passed, the authorities in charges became more and more confident of the safety of the bridge - so much so, in fact, that they were planning to cancel the insurance policy on the bridge.

Starting at about 7:00 on the morning of November 7, 1940, the bridge began undulating persistently for three hours. Segments of the span were heaving periodically up and down as much as three feet. At about 10:00 a.m., something seemed to snap and the bridge began oscillated wildly. At one moment, one edge of the roadway was twenty-eight feet higher than the other; the next moment it was twenty-eight feet lower than the other edge. At 10:30 a.m. the bridge began cracking, and finally, at 11:10 a.m. the entire bridge came crashing down. Fortunately, only one car was on the bridge at the time of its failure. It belonged to a newspaper reporter who had to abandon the car and its sole remaining occupant, a pet dog, when the bridge began its violent twisting motion. The reporter reached safety, torn and bleeding, by crawling on hands and knees, desperately clutching the curb of the bridge. His dog went down with the car and the span - the only life lost in the disaster.

There were many humorous and ironic incidents associated with the collapse of the Tacoma bridge. When the bridge began heaving violently, the authorities notified Professor F. B. Farquharson of the University of Washington. Professor Farquharson had conducted numerous tests on a simulated model of the bridge and had assured everyone of its stability. The professor was the last man on the bridge. Even when the span was tilting more than twenty-eight feet up and down, he was making scientific observations with little or no anticipation of the imminent collapse of the bridge. When the motion increased in violence, he made his way to safety by scientifically following the yellow line in the middle of the roadway. The professor was one of the most surprised men when the span crashed into the water.

One of the insurance policies covering the bridge had been written by a local travel agent who had pocketed the premium and had neglected to report the policy, in the amount of $800,000, to his company. When he later received his prison sentence, he ironically pointed out that his embezzlement would never have been discovered if the bridge had only remained up for another week, at which time the bridge officials had planned to cancel all of the policies.

A large sign near the bridge approach advertised a local bank with the slogan "as safe as the Tacoma Bridge." Immediately following the collapse of the bridge, several representatives of the bank rushed out to remove the billboard.

After the collapse of the Tacoma Bridge, the governor of the state of Washington made an emotional speech, in which he declared "We are going to build the exact same bridge, exactly as before." Upon hearing this, the noted engineer von Karman sent a telegram to the governor stating "If you build the exact same bridge exactly as before, it will fall into the exact same river exactly as before."

Overall Idea

The overall idea behind this Review is to select a very narrow part of Maple functions, say 35 most usable functions of Maple's 3500, under severe limitations and measure the number of bugs there in Maple versions over a decade.

The workhorses of this research are the GEMM, and later, the VM environments engineered by the author and implemented by Cyber Tester.

int, limit, evalf, simplify, sum, product, plot, ApproximateInt, Summation,

In our pre-release 0.1, we practically do NOT consider bug results in solve, dsolve, odetest, rsolve… and dozens other useful functions like series, asympt, singular, is, iscont, fdiscont, fourier, invfourier, laplace, invlaplace, hilbert, invhilbert, hankel, invhankel, mellin, invmellin, fouriercos, fouriersin, convert, maximize, minimize, plot3d etc … these and much other useful stuff will be included in the final release.

Introduction

A sunny June 1993 day… Institute of Cybernetics… I still have a vivid memory of one of the most important events in my lifetime. It was then when in I was shown for the first time the Maple, to be more precise, the Maple V Release 2.

By that time I already had experience with Reduce, since 1983, and Derive, since 1991.

evolution of

A passionate Maple buff since 1993, I am deeply concerned with the aerobatics currently making by Maplesoft.

Successes

1. Error messages are now more readable and informative. Now they often the user either to guess how to proceed or state this directly.

```
Error, (in Heaviside) Heaviside takes one algebraic argument
```

Unfortunately, there are still error messages which reads ridiculously, and are never explained elsewhere. For example, my pet peeve sounds, `should not happen 33`

Who ordered this? as Isidor Rabi exclaimed at the positron discovery.

2. FunctionWizard
3. ODE advisor
3. The author's pet peeve, Break button more or less work now.
4. Math dictionary
5. New help system
6. Tutors
7. Undocumented Protected Names

How *Exactly* Maple Is Degrading, Details?

Only 1 version examples.

The process of Maple degradation is fairly complex, at the current stage of our investigation we would state that it reminds something like multi-wave interaction and require at least an individual book to be written [2].

Here we show the reader several ways of Maple's, so to say, 'intellectual enfeeblement'.

Way # 1 – Monotonic Maple decay.

Way # 2 – Peak Maple decay.

Way # 3 – Oscillatory Maple decay.

……..

BUG # XXXXX	extrema: Error, (in X) numeric exception: division by zero	
REGRESSION	NO	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	ABSENT*	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	ABSENT*	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	ABSENT*	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	ABSENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223

	ABSENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	ABSENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	ABSENT	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	ABSENT	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: extrema(tan(z)^2, {}, z);

ACTUAL: Error, (in ln) numeric exception: division by zero

EXPECTED: {0}

CHECKUP: min(op(extrema(ln(z)^2/z,{},z)));

0

COMMENT: ABSENT* = Maple returns {tan(0)^2} .

HINT: plot(tan(z)^2, z= -5..5, -5..5);

COMMENT: For Maple V Release 5 downwards, use the following syntax.

readlib(extrema): extrema(tan(z)^2, {}, z);

Maple destruction example.

BUG # XXXXX: int (1-D): EXCEPTION IS NOT RAISED

REGRESSION: YES

REPRODUCIBLE: ALWAYS

BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	ABSENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	ABSENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	ABSENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	ABSENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	PRESENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	PRESENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	PRESENT	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	UNEVAL	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: sum(1/(n-1)!, n= 0..infinity);

ACTUAL: exp(1)

EXPECTED:	Error, (in sum/infinite) summand is singular at n = 0 in the interval of summation

CHECKUP:	sum(1/(n-1)!, n= 0..2);
	add(1/(n-1)!, n= 0..2);
	
	Error, (in NumericRange) summand is singular in the interval of summation
	Error, numeric exception: division by zero

Maple destruction example.

BUG # XXXXX	maximize: KEEPS RUNNING AFTER 4000 SECONDS OR LONGER	
REGRESSION	YES	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	ERROR	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	UNEVAL	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	ABSENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	BUG-1	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	BUG-2	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994
EXPRESSION:	maximize(sin(z)/(1+z), z= 0..infinity);	
ACTUAL:	Maple keeps running after 4000 seconds.	
EXPECTED:	sin(RootOf(-tan(_Z)+1+_Z))/(1+RootOf(-tan(_Z)+1+_Z)) .4246077543	
CHECKUP:	f:= sin(z)/(1+z): sol:= solve(diff(f, z)): subs(z=sol, f); sin(RootOf(-tan(_Z)+1+_Z))/(1+RootOf(-tan(_Z)+1+_Z)) .4246077543	
HINT:	plot(sin(z)/(1+z), z= 0..2);	
COMMENT:	ERROR = Error, (in convert/real_rat) too many levels of recursion UNEVAL = Maple returns minimize(z*sin(z),z = 0 .. infinity)	

ABSENT = Maple returns

sin(RootOf(tan(_Z)-1-_Z,1.132267725))/(1+RootOf(tan(_Z)-1-_Z,1.132267725))

.4246077543

BUG-1 = Maple returns 0 .

BUG-2 = Maple returns infinity .

COMMENT: For Maple V Release 5 and the earlier versions, use the syntax

maximize(sin(z)/(1+z), z, {z= 0..infinity});

Raw Functionality

dilog – released in Maple V Release 3 (earlier?) -> how works

KummerU – released in Maple V Release 3 (earlier?) -> how works

Standard worksheets – released in Maple 9 -> how works

Does Maplesoft Force Upgrades To Get Bugs Fixed?

Read full story Aug 28, 2004 sci.math.symbolic
Brad Cooper, Re: Does MuPad 3.0 support Elliptic Integrals?

```
I particularly want a CAS which can accurately calculate elliptic integrals. Maple
fails to do this...

http://www.math.rwth-aachen.de/mapleAnswers/html/1346.html

The GEMM project to track the horrendous number of bugs in Maple has made me decide it
is not good value for money. There appears to be no quality control whatsoever. You
can do a Google search on this topic.

--
Cheers,
Brad
```

Read full story Jun 22, 2001 comp.soft-sys.math.maple
Humberto Jose Bortolossi, Does maplesoft force upgrades to get bugs fixed?

```
A maple user has reported a (new) bug in Maple 6.x in the maple mailing list:

int(log(sin(t)), t = 0..Pi);  returns 0 while
int(log(sin(x)), x = 0..Pi);  returns -Pi*ln(2).
```

```
Below is the reply from maplesoft:

==========
From: Jason Schattman <jschattman@maplesoft.com>
To: "'maple-list@daisy.uwaterloo.ca'" <maple-list@daisy.uwaterloo.ca>
Subject: A problem in Maple 6
Date: Fri, 15 Jun 2001 15:58:03 -0400

This bug has been fixed in Maple 7. Both of the problems given below output -Pi*ln(2).

Best regards,

Jason Schattman, Ph.D.
Manager, Applications Marketing
Waterloo Maple Inc.
57 Erb Street West, Waterloo, Ontario N2L6C2
(519) 747-1278 x 351
=========

My question is: why should we upgrade to Maple 7 in order to have these bugs fixed?

Why does maplesoft not release a FREE patch for Maple 6.x owners? I do remember, when
Maple was too young (version 3), that a serious integration bug was found. In that
time, Maplesoft released a free patch. A very good procedure with us, customers. But
now, the default answer for a new bug is: WAIT FOR THE NEW RELEASE OF MAPLE. Oh, my.

It's right to pay for improvements in Maple but I think is wrong to pay for bug fixes.
```

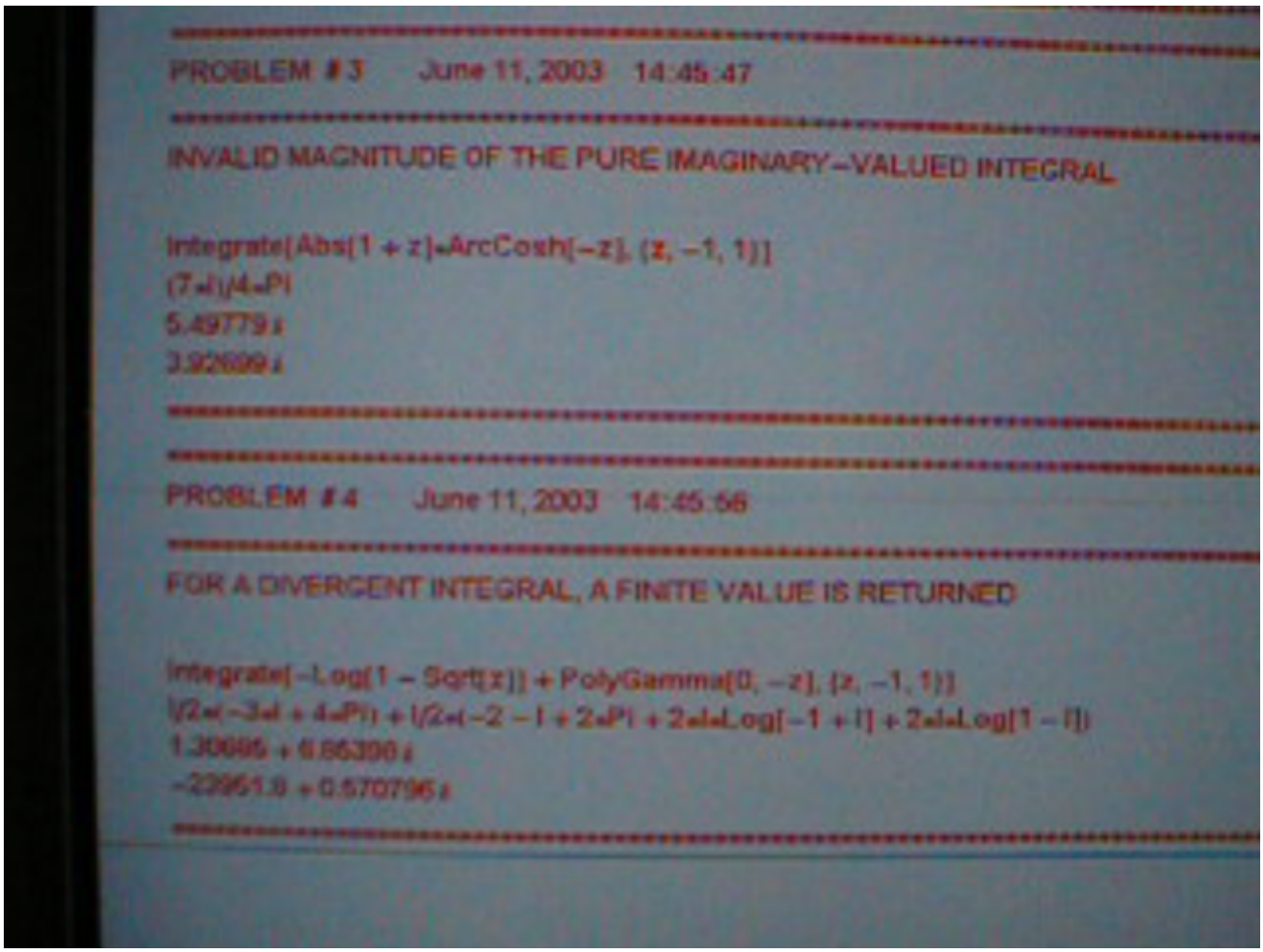
Review Of Maple Reviews

There are many useful suggestions in Maple reviews. We find the most interesting

Robert Israel's database – a part of Maple

Maple Application Limits?

GEMM: Genuine Error Monitor for Maple



DESCRIPTION	It took Maplesoft 9 years (1995-2004) to fix this bug. The output involves BesselJ(0) or LegendreP(2) which makes no sense as according to Maple Help the calling sequence for the Bessel functions or Legendre functions and associated Legendre functions of the first and second kinds must have at least 2 arguments. The same holds for dozens other functions (see below).
EXPRESSION	with(inttrans): laplace(z/BesselJ(0,z),z,s);
ACTUAL:	1/(BesselJ(0)*s^2)

User Reported Bugs Never Corrected

According to Maplesoft's site, http://www.maplesoft.com/support/

Maplesoft is committed to providing the highest level of support for the products it sells.

The Maple Bug Encyclopaedia came into being in 2002, gives thousands Maple bugs showing that the above slogan is just an questionable expedient to catch a customer, to entice the customer to shell out.
But even if one would forget for a minute about Encyclopaedia, there are at least dozens publicly known bugs Waterloo Maple, Inc / Maplesoft did not exert itself much to fix.

……………………………………………………………………………………………………...

BUG # XXXXX evalf: INVALID MAGNITUDE

!!!
!!! NONE of Maple versions can approximate this sum correctly !!!
!!!

REGRESSION NO

REPRODUCIBLE ALWAYS

BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	PRESENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	PRESENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	PRESENT	Maple 6, IBM INTEL NT, Jan 31 2000 Build ID 16401
	PRESENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	PRESENT	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	PRESENT	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: evalf(sum(1/round(sqrt(n))^3, n= 1..infinity));

ACTUAL: 2.000000000

EXPECTED: A real number close to 3.28354 .

CHECKUP:

```
evalf(add(1/round(sqrt(n))^3, n= 1..100));
evalf(add(1/round(sqrt(n))^3, n= 1..1000));
evalf(add(1/round(sqrt(n))^3, n= 1..10000));
```

3.089535462
3.226625541
3.269867800

COMMENT: http://www.math.ncsu.edu/MapleInfo/MapleArchive/BugList.html

COMMENT: Mathematica 5 approximates this sum correctly.

APPROXIMATE ME: NSum[1/Round[Sqrt[n]]^3, {n, 1, Infinity}]

3.28465

The same bug manifestation with

evalf(sum(1/round(n^(1/3))^4, n= 1..infinity));

……

……

BUG # XXXXX limit (1-D): SPURIOUS DIVERGENCE

REGRESSION YES

REPRODUCIBLE ALWAYS

BUG HISTORY:

PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
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PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
PRESENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
PRESENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
PRESENT	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
ABSENT	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: limit(1/7*7^z*6^z*2^z/(12^z)/(7^z-6^z), z= infinity);

ACTUAL: infinity

EXPECTED: 1/7

.1428571429

CHECKUP: evalf(limit(1/7*7^z*6^z*2^z/(12^z)/(7^z-6^z), z= 1000));

.1428571429

COMMENT: Mathematica 5 and MuPAD 3 calculate this integral correctly.

INTEGRATE ME: Limit[(1/7) 7^z 6^z 2^z/((12^z) (7^z - (6^z))), z -> Infinity]
limit(1/7*7^z*6^z*2^z/(12^z)/(7^z-6^z), z= infinity);

1/7
1/7

COMMENT: Newsgroup: sci.math.symbolic
http://mathforum.org/epigone/sci.math.symbolic/khouphingdun
Author: Alois Heinz <heinz@sun2.ruf.uni-freiburg.de>
Organization: Rechenzentrum der Universitaet Freiburg, Germany

Date: 3 Mar 1998 12:40:41 GMT
Subject: Maple bug - explanation?

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BUG # XXXXX changevar: INVALID FUNCTION

REGRESSION YES

REPRODUCIBLE ALWAYS

BUG HISTORY:

PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
PRESENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
PRESENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
PRESENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
PRESENT	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
ABSENT	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION:

```
with(student, changevar):
int1 := Int(1, z= 1..2):
changevar(t=1-1/sqrt(z), int1, t);
```

ACTUAL:

```
Int(2/(-1+t)^3, t = (0 .. 1/2*(2^(1/2)-1)*2^(1/2)))

value(%);

-1
```

EXPECTED:

```
Int(2/(1-t)^3, t= 0 .. 1-1/2*2^(1/2))

value(%);

1
```

COMPARE:

```
with(student, changevar):
int1 := Int(1, z= 1..2):
s := changevar(t=1+1/sqrt(z), int1, t):
value(s);

1
```

COMMENT: Newsgroup: MUG
URL: http://www.scg.uwaterloo.ca/~maple_gr/Digests/Digest99.11
From: "Francis Sergeraert" <Sergeraert@ujf-grenoble.fr>
Date: Fri, 12 Nov 1999 09:29:04 +0100

Subject: [MUG] Bug in changevar.

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BUG # XXXXX fsolve: INVALID MAGNITUDE

REGRESSION YES

REPRODUCIBLE ALWAYS

BUG HISTORY:

PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
PRESENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
PRESENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
PRESENT	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
ABSENT	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
ABSENT	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: fsolve({3*x*y-y^2 = 4, 2*x^2+y = 9}, {x,y}, maxsols = 4);

ACTUAL: {x = 2.031216860, y = .7483161322}

EXPECTED:
{x = -2.946194209, y = -8.360120631},
{x = 2.031216860, y = .7483161321},
{y = 3.787128638, x = 1.614445936},
{x = -2.199468588, y = -.6753241393}

CHECKUP:
```
restart; _EnvExplicit:=true:
fnormal([evalf(solve({3*x*y-y^2=4,2*x^2+y=9},{x,y}))]);

[{x = 2.031216858-0.*I, y = .748316152+0.*I},
{x = 1.614445942+0.*I, y = 3.787128600-0.*I},
{y = -.675324166-0.*I, x = -2.199468591-0.*I},
{x = -2.946194209-0.*I, y = -8.36012063-0.*I}]
```

COMMENT:
Newsgroup: MUG
URL: http://www.scg.uwaterloo.ca/~maple_gr/Digests/Digest01.02
Subject: [MUG] Problems with fsolve in Maple V 5.1
From: Sunil Koswatta <skoswatt@harper.cc.il.us>
Date: Wed, 21 Jul 1999 08:51:38 -0500

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BUG # XXXXX residue: INVALID MAGNITUDE

!!!
!!! NONE of Maple versions can calculate this residue correctly !!!
!!!

REGRESSION	NO	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	PRESENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	PRESENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	UNEVAL	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	UNEVAL	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	UNEVAL	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: residue(z/(1+z^5), z= cos(Pi/5)+I*sin(Pi/5));

ACTUAL: 0

EXPECTED: -1/5*(-1)^(2/5)

-0.6180339880e-1-.1902113032*I

COMMENT: UNEVAL = Maple returns

residue(z/(1+z^5),z = 1/4*5^(1/2)+1/4+1/4*I*2^(1/2)*(5-5^(1/2))^(1/2))

WORKAROUND: residue(z/(1+z^5), z= exp(I*Pi/5));

-1/5*(-1)^(2/5)

COMMENT: For Maple V Release 5 and the versions downwards use
readlib(residue): residue(z/(1+z^5), z= cos(Pi/5)+I*sin(Pi/5));

COMMENT: Mathematica 5 calculates this residue correctly.

Residue[z/(1 + z^5), {z, Cos[Pi/5] + I Sin[Pi/5]}]

(-1 - Sqrt[5] - I*Sqrt[2*(5 - Sqrt[5])])/(5*(1 + Sqrt[5] - I*Sqrt[2*(5 - Sqrt[5])]))

-0.0618034 - 0.190211 I

COMMENT: http://www.math.ubc.ca/~israel/advisor/advisor6/b10r1.htm

Maple Advisor Database by Robert Israel

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BUG # XXXXX int (1-D): SIMPLE INTEGRAL CANNOT BE CALCULATED

!!
!!! NONE of Maple versions can calculate this integral correctly !!!
!!

REGRESSION NO

REPRODUCIBLE ALWAYS

BUG HISTORY:

PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
PRESENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
BUG-1	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
BUG-1	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
BUG-1	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
BUG-1	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: int(z/(2-cos(z^2)^2), z= 0..2);

ACTUAL: int(z/(2-cos(z^2)^2),z = 0 .. 2)

EXPECTED: 1/4*2^(1/2)*(Pi+arctan(tan(4)*2^(1/2)))

1.472239815

CHECKUP: evalf(Int(z/(2-cos(z^2)^2), z= 0..2));

1.472239815

COMMENT: BUG-1 = Maple returns

1/4*2^(1/2)*arctan((2^(1/2)+1)*tan(2))+1/4*2^(1/2)*arctan((2^(1/2)-1)*tan(2))

-.7492016532

COMMENT: Derive 6.1 and Mathematica 5.0.1 calculate this integral correctly.

INTEGRATE ME: INT(z/(2 - COS(z^2)^2), z, 0, 2)
Integrate[z/(2 - Cos[z^2]^2), {z, 0, 2}]

SQRT(2) - SQRT(2)*ATAN(SIN(8)/(COS(8) - 2*SQRT(2) - 3))/4
Pi/(2*Sqrt[2]) + ArcTan[Sqrt[2]*Tan[4]]/(2*Sqrt[2])

1.472239815
1.47224

COMMENT: http://www.math.ubc.ca/~israel/advisor/advisor6/a11r1.htm

Maple Advisor Database by Robert Israel

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BUG # XXXXX int (1-D): SPURIOUS NON-ZERO IMAGINARY PART

!!
!!! NONE of Maple versions can calculate this integral correctly !!!
!!

REGRESSION NO

REPRODUCIBLE ALWAYS

BUG HISTORY:

PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
BUG-1	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
BUG-1	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
UNEVAL	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
BUG-2	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
BUG-1	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
LOOPED	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: int(z/(sin(z)^3+cos(z)^3), z= 0..Pi/2);

ACTUAL:

```
(1/48+1/48*I)*(-Pi*2^(1/2)*ln(2-3^(1/2))+4*dilog((-1+I+2^(1/2)*3^(1/2)*(-1)^(1/4\
))/(-1-I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^(1/2)+4*dilog((1-I+2^(1/2)*3^(1/2)*(-1)^\
(1/4))/(1+I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^(1/2)-4*dilog((-1-3*I+2^(1/2)*3^(1/2)\
*(-1)^(1/4))/(-1-I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^(1/2)-Pi*2^(1/2)*ln(2+3^(1/2))\
-4*dilog((1+3*I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(1+I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^\
(1/2)+2*2^(1/2)*Pi*arctan(1/(2+3^(1/2)))-2*2^(1/2)*Pi*arctan(1/(-2+3^(1/2)))-2*P\
i*ln(2-2^(1/2))+2*I*2^(1/2)*Pi*arctan(1/(-2+3^(1/2)))-2*I*2^(1/2)*Pi*arctan(1/(2\
+3^(1/2)))-I*Pi*2^(1/2)*ln(2-3^(1/2))-I*Pi*2^(1/2)*ln(2+3^(1/2))+8*I*dilog(1-1/2\
*2^(1/2)-1/2*I*2^(1/2))-8*I*dilog(1/2*2^(1/2)-1/2*I*2^(1/2)+1)-8*I*dilog(1+1/2*2\
^(1/2)+1/2*I*2^(1/2))+8*I*dilog(-1/2*2^(1/2)+1/2*I*2^(1/2)+1)-4*I*Pi*arctan(1/(2\
^(1/2)-1))-4*I*Pi*arctan(1/(1+2^(1/2)))+2*I*Pi*ln(2-2^(1/2))-2*I*Pi*ln(2+2^(1/2)\
)+4*I*dilog((-1+I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(1+I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*\
2^(1/2)-4*I*dilog((3+I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(1+I+2^(1/2)*3^(1/2)*(-1)^(1/\
4)))*2^(1/2)+4*I*dilog((1-I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(-1-I+2^(1/2)*3^(1/2)*(-\
1)^(1/4)))*2^(1/2)-4*I*dilog((-3-I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(-1-I+2^(1/2)*3^(\
1/2)*(-1)^(1/4)))*2^(1/2)-4*I*dilog((1-I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(1+I+2^(1/2\
)*3^(1/2)*(-1)^(1/4)))*2^(1/2)-4*I*dilog((-1+I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(-1-I\
+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^(1/2)+4*I*dilog((1+3*I+2^(1/2)*3^(1/2)*(-1)^(1/4\
))/(1+I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^(1/2)+4*I*dilog((-1-3*I+2^(1/2)*3^(1/2)*(\
-1)^(1/4))/(-1-I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^(1/2)+4*dilog((3+I+2^(1/2)*3^(1/\
2)*(-1)^(1/4))/(1+I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^(1/2)-4*dilog((1-I+2^(1/2)*3^\
(1/2)*(-1)^(1/4))/(-1-I+2^(1/2)*3^(1/2)*(-1)^(1/4)))*2^(1/2)-8*dilog(1/2*2^(1/2)\
```

-1/2*I*2^(1/2)+1)-4*dilog((-1+I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(1+I+2^(1/2)*3^(1/2)\
*(-1)^(1/4)))*2^(1/2)+4*dilog((-3-I+2^(1/2)*3^(1/2)*(-1)^(1/4))/(-1-I+2^(1/2)*3^\
(1/2)*(-1)^(1/4)))*2^(1/2)+8*dilog(-1/2*2^(1/2)+1/2*I*2^(1/2)+1)-4*Pi*arctan(1/(\
1+2^(1/2)))-8*dilog(1+1/2*2^(1/2)+1/2*I*2^(1/2))-4*Pi*arctan(1/(2^(1/2)-1))+2*Pi\
*ln(2+2^(1/2))+8*dilog(1-1/2*2^(1/2)-1/2*I*2^(1/2)))*2^(1/2)

1.475106978-1.379115081*I

EXPECTED: 1/12*Pi*(Pi-sqrt(2)*ln(3-2*sqrt(2)))

1.475106977

CHECKUP: evalf(Int(ln(1+z)*ln(1-z^2), z= 0..1));

-.3624581085

HINT: plot(z/(sin(z)^3+cos(z)^3), z= 0..Pi/2);

COMMENT 1: BUG-1 = Maple returns

1/6*(I*Pi*ln(2-2^(1/2)+I*2^(1/2))-2*I*dilog(11/(-I)^(1/2))+2*I*dilog(1-(1/(-I)^(\
1/2)))+I*Pi*(-I)^(1/2)*ln(-I*3^(1/2)+3+I-3^(1/2))-2*dilog(-1/(1+I-6^(1/2)*(-1)^(\
1/4))+I/(1+I-6^(1/2)*(-1)^(1/4))-1/(1+I-6^(1/2)*(-1)^(1/4))*6^(1/2)*(-1)^(1/4))*\
(-I)^(1/2)+2*I*dilog(1+I/(-I)^(1/2))-2*dilog(-1/(1+I+6^(1/2)*(-1)^(1/4))+I/(1+I+\
6^(1/2)*(-1)^(1/4))+1/(1+I+6^(1/2)*(-1)^(1/4))*6^(1/2)*(-1)^(1/4))*(-I)^(1/2)-I*\
Pi*(-I)^(1/2)*ln(1-I-3^(1/2)-I*3^(1/2))-Pi*ln(2-2^(1/2)+I*2^(1/2))-2*dilog(1/(1+\
I+6^(1/2)*(-1)^(1/4))+3*I/(1+I+6^(1/2)*(-1)^(1/4))+1/(1+I+6^(1/2)*(-1)^(1/4))*6^\
(1/2)*(-1)^(1/4))*(-I)^(1/2)+I*Pi*(-I)^(1/2)*ln(I*3^(1/2)+3+I+3^(1/2))-2*dilog(1\
/(1+I-6^(1/2)*(-1)^(1/4))+3*I/(1+I-6^(1/2)*(-1)^(1/4))-1/(1+I-6^(1/2)*(-1)^(1/4)\
)*6^(1/2)*(-1)^(1/4))*(-I)^(1/2)+2*dilog(1/(1+I+6^(1/2)*(-1)^(1/4))-I/(1+I+6^(1/\
2)*(-1)^(1/4))+1/(1+I+6^(1/2)*(-1)^(1/4))*6^(1/2)*(-1)^(1/4))*(-I)^(1/2)+2*dilog\
(1/(1+I-6^(1/2)*(-1)^(1/4))-I/(1+I-6^(1/2)*(-1)^(1/4))-1/(1+I-6^(1/2)*(-1)^(1/4)\
)*6^(1/2)*(-1)^(1/4))*(-I)^(1/2)-I*Pi*(-I)^(1/2)*ln(1-I+3^(1/2)+I*3^(1/2))+2*dil\
og(1+I/(-I)^(1/2))-2*dilog(1-I/(-I)^(1/2))-2*dilog(11/(-I)^(1/2))+2*dilog(1-(1/(\
-I)^(1/2)))-2*I*dilog(1-I/(-I)^(1/2))+Pi*ln(2+2^(1/2)-I*2^(1/2))+2*dilog(3/(1+I+\
6^(1/2)*(-1)^(1/4))+I/(1+I+6^(1/2)*(-1)^(1/4))+1/(1+I+6^(1/2)*(-1)^(1/4))*6^(1/2\
)*(-1)^(1/4))*(-I)^(1/2)+2*dilog(3/(1+I-6^(1/2)*(-1)^(1/4))+I/(1+I-6^(1/2)*(-1)^\
(1/4))-1/(1+I-6^(1/2)*(-1)^(1/4))*6^(1/2)*(-1)^(1/4))*(-I)^(1/2)-I*Pi*ln(2+2^(1/\
2)-I*2^(1/2)))/(-I)^(1/2)

-.1698270885-1.379115084*I

BUG-2 = Maple returns

1/3*I*2^(1/2)*dilog(-1/2*2^(1/2)+1/2*I*2^(1/2))+1/3*I*2^(1/2)*dilog(-1/2*2^(1/2)\
-1/2*I*2^(1/2))+1/3*dilog(1+2*I/(-1-I+3^(1/2)+I*3^(1/2)))-1/3*I*2^(1/2)*ln(2)*ln\
(1-2^(1/2)+I)+1/3*I*2^(1/2)*ln(2)*ln(I-2^(1/2)-1)-1/3*I*2^(1/2)*ln(2^(1/2)-I*2^(\
1/2))*ln(I-2^(1/2)-1)-1/3*I*2^(1/2)*ln(2)*ln(-I-2^(1/2)+1)-1/3*I*2^(1/2)*ln(-2^(\
1/2)+I*2^(1/2))*ln(-1-2^(1/2)-I)+1/3*I*2^(1/2)*ln(2^(1/2)-I*2^(1/2))*ln(1-2^(1/2\
)+I)+1/3*I*2^(1/2)*ln(2)*ln(-1-2^(1/2)-I)+1/3*I*2^(1/2)*ln(-2^(1/2)+I*2^(1/2))*l\
n(-I-2^(1/2)+1)-1/3*dilog(2*I/(1+I+3^(1/2)+I*3^(1/2)))-1/3*ln(1+I+3^(1/2)+I*3^(1\
/2))*ln(-3+I-I*3^(1/2)+3^(1/2))+1/3*dilog(2*I/(-1-I+3^(1/2)+I*3^(1/2)))-1/3*ln(2\

)*ln(-I-I*3^(1/2)-1+3^(1/2))+1/3*ln(2)*ln(1+I-I*3^(1/2)+3^(1/2))+1/3*ln(2)*ln(-1\
+I+3^(1/2)+I*3^(1/2))-1/3*ln(-1-I+3^(1/2)+I*3^(1/2))*ln(-1+I+3^(1/2)+I*3^(1/2))+\
1/3*ln(1+I+3^(1/2)+I*3^(1/2))*ln(-3+3^(1/2)-I+I*3^(1/2))-1/3*ln(I/(-1-I-3^(1/2)-\
I*3^(1/2)))*ln(1-I+3^(1/2)+I*3^(1/2))-1/3*ln(2)*ln(-3-3^(1/2)-I-I*3^(1/2))+1/3*l\
n(I/(-1-I-3^(1/2)-I*3^(1/2)))*ln(2)-1/3*ln(2)*ln(-3+3^(1/2)-I+I*3^(1/2))+1/3*ln(\
2)*ln(3+I+3^(1/2)+I*3^(1/2))-1/3*ln(I/(1+I-3^(1/2)-I*3^(1/2)))*ln(2)+1/3*ln(I/(1\
+I-3^(1/2)-I*3^(1/2)))*ln(3+I+3^(1/2)+I*3^(1/2))-1/3*ln(1+I-3^(1/2)-I*3^(1/2))*l\
n(2)+1/3*ln(1+I-3^(1/2)-I*3^(1/2))*ln(-3-3^(1/2)-I-I*3^(1/2))-1/3*ln(2)*ln(1-I+3\
^(1/2)+I*3^(1/2))-1/3*ln(1+I-3^(1/2)-I*3^(1/2))*ln(-3+I+I*3^(1/2)-3^(1/2))-1/3*l\
n(2)*ln(3-I-I*3^(1/2)+3^(1/2))+1/3*ln(-1-I+3^(1/2)+I*3^(1/2))*ln(-I-I*3^(1/2)-1+\
3^(1/2))-1/3*ln(-1-I-3^(1/2)-I*3^(1/2))*ln(1+I-I*3^(1/2)+3^(1/2))-1/3*ln(-1-I-3^\
(1/2)-I*3^(1/2))*ln(I-I*3^(1/2)-1-3^(1/2))+1/3*ln(2)*ln(-3+I+I*3^(1/2)-3^(1/2))+\
1/3*ln(2)*ln(-3+I-I*3^(1/2)+3^(1/2))+1/3*ln(2)*ln(I-I*3^(1/2)-1-3^(1/2))+1/3*ln(\
1+I-3^(1/2)-I*3^(1/2))*ln(3-I-I*3^(1/2)+3^(1/2))-1/3*ln(2)*ln(-I+I*3^(1/2)-1-3^(\
1/2))+1/3*ln(-1-I-3^(1/2)-I*3^(1/2))*ln(2)+1/3*ln(-1-I-3^(1/2)-I*3^(1/2))*ln(-I+\
I*3^(1/2)-1-3^(1/2))-1/3*I*2^(1/2)*dilog(1/2*2^(1/2)-1/2*I*2^(1/2))+1/3*dilog(2/\
(1+I+3^(1/2)+I*3^(1/2)))-1/3*dilog(1+2*I/(1+I+3^(1/2)+I*3^(1/2)))-1/3*dilog(2/(-\
1-I+3^(1/2)+I*3^(1/2)))-1/3*I*2^(1/2)*dilog(1/2*2^(1/2)+1/2*I*2^(1/2))-1/3*dilog\
(1+2/(-1-I+3^(1/2)+I*3^(1/2)))+1/3*dilog(1+2/(1+I+3^(1/2)+I*3^(1/2)))

.3784842668+2.758230169*I

COMMENT 2: Mathematica 5 calculates this integral correctly.

INTEGRATE ME: Integrate[z/(Sin[z]^3+Cos[z]^3), {z, 0, Pi/2}]

-Catalan/(3*Sqrt[2]) + Pi^2/6 + (I/96)*Pi^2*Csc[Pi/8]^2 - (I/96)*Pi^2*Csc[(3*Pi)\
/8]^2 - (Pi*Log[1 - (-1)^(1/4)])/(6*Sqrt[2]) + (Pi*Log[1 + (-1)^(1/4)])/(6*Sqrt[\
2]) + (Pi*Log[1 - (-1)^(3/4)])/(2*Sqrt[2]) - (Pi*Log[1 + (-1)^(3/4)])/(2*Sqrt[2]\
) + (Pi*Log[2 - Sqrt[2]])/(6*Sqrt[2]) - (Pi*Log[2 + Sqrt[2]])/(6*Sqrt[2]) - (I/6\
)*Pi*Log[(-2 - I) + Sqrt[3]] + (I/6)*Pi*Log[-I + Sqrt[3]] + (I/6)*Pi*Log[I + Sqr\
t[3]] - (I/6)*Pi*Log[(2 + I) + Sqrt[3]] - (I/3)*Sqrt[2]*PolyLog[2, (-1 - I)/Sqrt\
[2]] + (I/3)*Sqrt[2]*PolyLog[2, (1 - I)/Sqrt[2]] + PolyLog[2, (-1/2 - I/2)*(-1 +\
Sqrt[3])]/3 - PolyLog[2, (-1/2 + I/2)*(-1 + Sqrt[3])]/3 + PolyLog[2, (1/2 - I/2\
)*(-1 + Sqrt[3])]/3 - PolyLog[2, (1/2 + I/2)*(-1 + Sqrt[3])]/3 - PolyLog[2, (-1 \
- I)/(1 + Sqrt[3])]/3 + PolyLog[2, (-1 + I)/(1 + Sqrt[3])]/3 - PolyLog[2, (1 - I\
)/(1 + Sqrt[3])]/3 + PolyLog[2, (1 + I)/(1 + Sqrt[3])]/3

1.47511

COMMENT: Newsgroup: MUG
URL: http://www.math.rwth-aachen.de/mapleAnswers/html/282.html
Subject: [MUG] bug in int() routine in Maple V.4 and Maple V.5 (1.3.97)

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BUG # XXXXX int (1-D): SIMPLE INTEGRAL CANNOT BE CALCULATED

!!
!!! NONE of Maple versions can calculate this integral correctly !!!

!!!

REGRESSION	NO	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	BUG-1	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	PRESENT	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	PRESENT	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	BUG-1	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	BUG-1	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	BUG-1	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: int(sin(ln(1+exp(z)))/(1+exp(z))/(1+exp(-z)), z= 0..infinity);

ACTUAL: int(sin(ln(1+exp(z)))/(1+exp(z))/(1+exp(-z)),z = 0 .. infinity)

EXPECTED: 1/4*cos(ln(2))+1/4*sin(ln(2))

.3520500444

CHECKUP: evalf(Int(sin(ln(1+exp(z)))/(1+exp(z))/(1+exp(-z)), z= 0..infinity));

.3520500444

COMMENT: BUG-1 = Maple returns undefined .

COMMENT: Mathematica 5.0.1 calculates this integral correctly.

INTEGRATE ME: Integrate[Sin[Log[1 + Exp[z]]]/((1 + Exp[z])(1 + Exp[-z])), {z, 0, Infinity}]

2^(-3 - I)*((1 + I) + (1 - I)*2^(2*I))

0.35205

COMMENT: Newsgroup: comp.soft-sys.math.maple

URL:
http://groups.google.com/groups?hl=en&lr=&safe=off&selm=3C35AE3D.208E1196%40pop.dtu.dk
Subject: Bug in int in Maple 7
From: Preben Alsholm (ifakpa@pop.dtu.dk)
Date: 2002-01-04 05:25:00 PST

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BUG # XXXXX RationalFunctionTutor: USER HAS NO CONTROL

!!!
!!! NONE of Maple versions provide the customer with control !!!
!!!

REGRESSION NO

REPRODUCIBLE ALWAYS

BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	N/A	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	N/A	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	N/A	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	N/A	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	N/A	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	N/A	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

DESCRIPTION: There is no user's control over the range of the variables.

EXPRESSION:
```
with(Student[Precalculus]):
RationalFunctionTutor((4*z^2+2*z-1)/(z-2));
```

ACTUAL: With default settings, only 1 branch is displayed and the user cannot change this.

EXPECTED: Two branches are displayed, and the user can change the range of the variable.

CHECKUP:
```
plot((4*z^2+2*z-1)/(z-2), z, -100..100);
```

COMMENT: URL: http://mathstore.ac.uk/newsletter/may2004/pdf/maple9.pdf

Review of Maple 9 by Nigel Backhouse

COMMENT: N/A = arrow is not implemented in the given Maple version

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BUG # XXXXX dsolve: MISSED SOLUTION

!!!
!!! NONE of Maple version can solve this ODE correctly !!!
!!!

REGRESSION YES

REPRODUCIBLE ALWAYS

BUG HISTORY:
PRESENT Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
PRESENT Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
PRESENT Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
PRESENT Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
PRESENT Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
PRESENT Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
PRESENT Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
PRESENT Maple V, Release 5, IBM INTEL NT, Nov 27 1997
PRESENT Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
PRESENT Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION:
```
dsolve(diff(y(z),z)+(2*z+y(z))/(z+y(z)+1), y(z));
```

ACTUAL:
```
y(z) = -2-((z-1)*_C1-(-(z-1)^2*_C1^2+1)^(1/2))/_C1
```

EXPECTED:
```
y(z) = -2-((z-1)*_C1-(-(z-1)^2*_C1^2+1)^(1/2))/_C1,
y(z) = -1-z-(-_C1^2*z^2+2*_C1^2*z-_C1^2+1)^(1/2)/_C1
```

WORKAROUND:
```
with(PDEtools):                 # See Helmut Kahovec, MUG
T := {x= t-1, y(x)= z(t)+1}:
ode2 := dchange(T, diff(y(x),x)+(4*x+3*y(x)+1)/(3*x+2*y(x)+1)):
dsolve(ode2, z(t)):
Tinv:={t=x+1,z(t)=y(x)-1}:
sol12 := op(map(isolate,subs(Tinv,[%%]), y(x)));

y(x) = (-3/2*(x+1)*_C1+1/2*((x+1)^2*_C1^2+4)^(1/2))/_C1+1,

y(x) = (-3/2*(x+1)*_C1-1/2*((x+1)^2*_C1^2+4)^(1/2))/_C1+1
```

COMMENT:
Mathematica 5 and MuPAD 3 solve this ODE correctly.

SOLVE ME:
```
DSolve[y'[z] + (2 z + y[z])/(z + y[z] + 1) == 0, y[z], z]
solve(ode(diff(y(z),z)+(2*z+y(z))/(z+y(z)+1), y(z)));

{{y[z] -> -1 - z - Sqrt[-2*z^2 + (1 + z)^2 + C[1]]},
{y[z] -> -1 - z + Sqrt[-2*z^2 + (1 + z)^2 + C[1]]}}

{ (2*z-2*C1-z^2+1)^(1/2)-z-1 ,
-z-(2*z-2*C1-z^2+1)^(1/2)-1 }
```

COMMENT:
Newsgroup: MUG
URL: http://www.scg.uwaterloo.ca/~maple_gr/Digests/Digest02.02
Subject: [MUG] dsolve does not find second solution
From: Helmut Kahovec <helmut.kahovec@teleweb.at>
Date: Mon, 16 Dec 2002 12:26:41 +0100

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First registered case GEMM gains lead a live top Maple expert

Are Maple Experts Always Infallible?

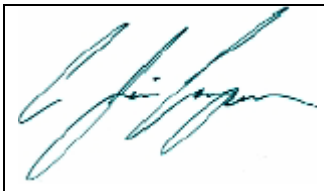
Testing and Assessment with MapleT.A.

Let the author quote Maple Reporter Q1, 2004

On behalf of the staff at Maplesoft, I would like to express our best wishes for 2004.We are looking forward to a very exciting year as we continue to build on the many significant achievements of the past year. 2003 will go down in Maplesoft history as one of major innovation and substantial increases in customer service. In addition to the great new features in Maple 9, it was also the year we introduced Maple T.A., and MapleNet. These new products have already made e-learning initiatives more effective and efficient. Our customer base for these new products continues to grow and we look forward to working with many more of you throughout 2004.

We also introduced a wide range of new service offerings including the Maple So what's new for 2004? Plenty. One of our main focus areas will be applications. Having earned the reputation as developers of the best general platform for math computing, we will be working hard to deliver additional components that will make it easier for anyone to access the full potential of our products – whether you are a teacher, a student, a researcher or an engineer in industry. As our range of offerings grows, we will be introducing a much greater range of customer service options to ensure that your experience with Maplesoft products – from purchase to use – is as smooth as possible. Overall our goal is simple: best products and best experiences for our customers.

Many of you have taken the time over the years to help us better understand your needs and to improve our products and services to meet these needs. Your contribution has been invaluable as we embark on this exciting year. Thank you and we encourage you to continue to send us your comments and help us build the most energetic and enthusiastic user community in software. ***Happy New Year!***

	C. James Cooper P.Eng. President and C.E.O. Maplesoft Jim Cooper **P. ENG.**, President & CEO, Maplesoft

Thus, unfortunately, upon reading the congratulations from Maplesoft's President and CEO we can see no promise to fix dozen thousands Maple bugs the long-livers as well as numerous newly introduced insects. So, we see the prospects here in the following way.

The very idea of making automated testing is attractive. However, small woner that, according to Maplesoft, Automated tests and assignments are

Backed by the Maple symbolic math engine

Taking into account the current Maple's unfixed bug degree and the increasing Maple instability, the prospect of dissemination of Maple might cause much headache in persons who take responsibility for the testing.

Obviously, currently Maplesoft cannot guarantee not only mathematical correctness of the checkups to the student's tests — thus, in fact, it will cause unnecessary, unpaid extra load to loaded already math instructors — but in the near future cannot even fix a tangible amount of 'student-level' bugs just because of the instability already demonstrated a bit in this Review.

Next,

High Stakes Tests -- Quizzes, exams - students get immediate feedback

At this point, to tell the truth, we feel great relief that we personally have no need to be tested within the framework of MapleT.A.

Both ecomomical and moral damages arising from using MapleT.A. relying upon the current buggy math engine seems to be imminent and almost inevitable.

Myths ## 1-10 About Maplesoft

Instability (1994-2004)

Possibly, if we would have access to earlier Maple versions than Maple V Release 3 of 1994, this effect could be found there also, but at least, instability exists in Maple from Maple V Release V upward.

………...

Maple V R 3 >
```
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
restart; limit(11^z*2^z/(22^z-7^z), z= infinity);
```

```
1
1
1
1
1
0
1
1
0
0
0
0
1
1
1
1
0
0
0
1
```

…………………………………………………………………………………………………...

Maple V R 3 >
```
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
restart; int(ln(sin(z)/ln(z)), z= 0..1);
```

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-I*ln(exp(I*z))*ln(exp(2*I*z)-1)-I*dilog(exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-1/2*I*z^2-Ei(1,-ln(z))-3/2*I*Pi-1/2*I-I*dilog(exp(I))-ln(2)+gamma+I*dilog(exp(I)+1)-I*ln(exp(I))* ln(exp(I)^2-1)+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

```
int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-I*ln(exp(I*z))*ln(exp(2*I*z)-1)-I*dilog(
exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-1/2*I*z^2-Ei(1,-ln(
z))-3/2*I*Pi-1/2*I-I*dilog(exp(I))-ln(2)+gamma+I*dilog(exp(I)+1)-I*ln(exp(I))*
ln(exp(I)^2-1)+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-1/2*I*z^2-I*ln(exp(I*z))*ln(exp(2*I*z)-1)
-I*dilog(exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-Ei(1,-ln(z
))-3/2*I*Pi-I*ln(exp(I))*ln(exp(I)^2-1)+I*dilog(exp(I)+1)-ln(2)+gamma-I*dilog(
exp(I))-1/2*I+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-I*ln(exp(I*z))*ln(exp(2*I*z)-1)-I*dilog(
exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-1/2*I*z^2-Ei(1,-ln(
z))-3/2*I*Pi-1/2*I-I*dilog(exp(I))-ln(2)+gamma+I*dilog(exp(I)+1)-I*ln(exp(I))*
ln(exp(I)^2-1)+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-1/2*I*z^2-I*ln(exp(I*z))*ln(exp(2*I*z)-1)
-I*dilog(exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-Ei(1,-ln(z
))-3/2*I*Pi-I*ln(exp(I))*ln(exp(I)^2-1)+I*dilog(exp(I)+1)-ln(2)+gamma-I*dilog(
exp(I))-1/2*I+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-I*ln(exp(I*z))*ln(exp(2*I*z)-1)-I*dilog(
exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-1/2*I*z^2-Ei(1,-ln(
z))-3/2*I*Pi-1/2*I-I*dilog(exp(I))-ln(2)+gamma+I*dilog(exp(I)+1)-I*ln(exp(I))*
ln(exp(I)^2-1)+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-1/2*I*z^2-I*ln(exp(I*z))*ln(exp(2*I*z)-1)
-I*dilog(exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-Ei(1,-ln(z
))-3/2*I*Pi-I*ln(exp(I))*ln(exp(I)^2-1)+I*dilog(exp(I)+1)-ln(2)+gamma-I*dilog(
exp(I))-1/2*I+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-1/2*I*z^2-I*ln(exp(I*z))*ln(exp(2*I*z)-1)
-I*dilog(exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-Ei(1,-ln(z
))-3/2*I*Pi-I*ln(exp(I))*ln(exp(I)^2-1)+I*dilog(exp(I)+1)-ln(2)+gamma-I*dilog(
```

exp(I))-1/2*I+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-1/2*I*z^2-I*ln(exp(I*z))*ln(exp(2*I*z)-1)
-I*dilog(exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-Ei(1,-ln(z
))-3/2*I*Pi-I*ln(exp(I))*ln(exp(I)^2-1)+I*dilog(exp(I)+1)-ln(2)+gamma-I*dilog(
exp(I))-1/2*I+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-1/2*I*z^2-I*ln(exp(I*z))*ln(exp(2*I*z)-1)
-I*dilog(exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-Ei(1,-ln(z
))-3/2*I*Pi-I*ln(exp(I))*ln(exp(I)^2-1)+I*dilog(exp(I)+1)-ln(2)+gamma-I*dilog(
exp(I))-1/2*I+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

int(ln(sin(z)/ln(z)),z = 0 .. 1)

limit(-z*ln(ln(z))-ln(2)*z-1/2*I*Pi*z-1/2*I*z^2-I*ln(exp(I*z))*ln(exp(2*I*z)-1)
-I*dilog(exp(I*z))+I*dilog(exp(I*z)+1)+I*ln(exp(I*z))*ln(exp(I*z)+1)-Ei(1,-ln(z
))-3/2*I*Pi-I*ln(exp(I))*ln(exp(I)^2-1)+I*dilog(exp(I)+1)-ln(2)+gamma-I*dilog(
exp(I))-1/2*I+I*ln(exp(I))*ln(exp(I)+1),z = 0,right)

………...

Publicly, it seems, instability is known since 1999 in MUG

………...

From: Ron Grimmer <rgrimmer@math.siu.edu>
Subject: [MUG] Bizarre convert to piecewise
Date: Mon, 8 Nov 1999 08:56:30 -0600

>> From: Ron Grimmer <rgrimmer@math.siu.edu>

Hi,

The command piecewise has come up in different ways recently and I would like to ask about my experience with this command.

I am attempting to teach a class on Maple and am perplexed about using the command convert with piecewise.

I have run into several problems when converting max to piecewise. In particular,

```
> f:=max(x^5,x^2);
                          2   5
               f := max(x , x )

> g:=convert(f,piecewise);
```

$$g := \begin{cases} x^2 & x \le 1 \\ 2x^2 - x^5 & 1 < x \end{cases}$$

Several examples of this type were discovered. Even more interesting is that sometimes a convert could be done with the correct answer being returned but after a restart an incorrect answer would be returned. One can even oscillate between the correct and an incorrect answer.

This happens on the student version release 4 in our lab and also on my release 5.0 Professional version.

Thanks for any help!
Ron Grimmer

……...

http://groups.google.com/groups?hl=en&lr=&safe=off&selm=989970247.917276%40bats.mcs.vuw.ac.nz

From: John Harper (harper@mcs.vuw.ac.nz)
Subject: Re: Incorrect integral
Newsgroups: comp.soft-sys.math.maple
Date: 2001-05-15 16:44:10 PST

In article <989967005.509179@bats.mcs.vuw.ac.nz>, John Harper <harper@mcs.vuw.ac.nz> wrote:
> ... in Maple 6:
>
>> int(ln(cos(z)),z=-Pi/2..Pi/2);
> 0

So I sent off that result for your amusement, and went and had some coffee, and then tried again, with the following amazing result:

```
    |\^/|     Maple 6 (DEC ALPHA UNIX)
._|\|   |/|_. Copyright (c) 2000 by Waterloo Maple Inc.
 \  MAPLE  /  All rights reserved. Maple is a registered trademark of
 <____ ____>  Waterloo Maple Inc.
      |       Type ? for help.
```

> int(ln(cos(x)),x=-Pi/2..+Pi/2);
-Pi ln(2)

That is now correct! I can't find anything in our system that changed during that time.

……...

Regression Bugs

Though we still did not complete the comprehensive search for Maple bugs in the Internet, it is obvious that regression bugs in Maple are publicly known since at least 1994.

Read full story Jul 2, 1994, sci.math.symbolic

John Vivian Matthews, Re: Integral Maple Can't Do

```
WITH RELEASE 2:
    |\^/|     Maple V Release 2 (North Carolina State University)
._|\|   |/|_. Copyright (c) 1981-1993 by the University of Waterloo.
 \  MAPLE  /  All rights reserved. Maple and Maple V are registered
 <____ ____>  trademarks of Waterloo Maple Software.
      |       Type ? for help.
> a := arcsin(sqrt(1-x^2));

                                              2 1/2
                              a := arcsin((1 - x )   )
> int(a,x);

                                    2 1/2           2 1/2
                        x arcsin((1 - x )   ) - (1 - x )

WITH RELEASE 3:
    |\^/|     Maple V Release 3 (North Carolina State University)
._|\|   |/|_. Copyright (c) 1981-1994 by Waterloo Maple Software and the
 \  MAPLE  /  University of Waterloo. All rights reserved. Maple and Maple V
 <____ ____>  are registered trademarks of Waterloo Maple Software.
      |       Type ? for help.
> a := arcsin(sqrt(1-x^2));

                                              2 1/2
                              a := arcsin((1 - x )   )

> int(a,x);
bytes used=1006152, alloc=786288, time=2.17
                                /
                                |               2 1/2
                                |  arcsin((1 - x )   ) dx
                                |
                               /
```

Recurring Regression Bugs

Sand-Solid Numerics

Incompatibility

Strategic planning is absent.

Different syntax: minimize, changecoords, discont …

Plotting Problems

....

BUG # XXXXX plot: KEEPS RUNNING AFTER 4000 SECONDS OR LONGER

!!
!!! NONE of Maple versions can draw this graph correctly !!!
!!

REGRESSION	NO	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	ERROR-1	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	ERROR-1	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	ERROR-2	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	ERROR-3	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	ERROR-3	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	ERROR-4	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	ERROR-5	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	ERROR-5	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994
EXPRESSION:	plot(Re(Int(arcsech(Re(z)), z= a..I)), a= 0..1);	
ACTUAL:	Maple keeps running after 40,000 seconds.	
EXPECTED:	A smooth parabola-like curve reminding the graph plot((ln(z/2)-1)*z-3/2, z= 0..1);	
COMMENT:	ERROR-1 = Error, (in @) too many levels of recursion	
	ERROR-2 = Error, (in unknown) too many levels of recursion	
	ERROR-3 = Error, (in signum) too many levels of recursion	
	ERROR-4 = Error, (in property/ConvertRelation) too many levels of recursion	
	ERROR-5 = Plotting error, empty plot	
COMMENT:	Mathematica 5 and MuPAD 3 draw this graph correctly.	
DRAW ME:	Plot[Re[NIntegrate[ArcSech[Re[z]], {z, a, I}]], {a, 0, 1}] plotfunc2d(Re(int(arcsech(Re(z)), z= a..I)), a= 0..1);	

The same bug manifestation with

plot(Re(Int(arcsech(Re(z)), z= a..I)), a= 1/3..1/2);
plot(Re(Int(arcsech(Re(z)), z= a..I)), a= 0..1/10);
plot(Re(Int(arcsech(Re(z)), z= a..I)), a= 1/100..1/10);

....

User's Convenience And Maple Syntax

Do you want to ask Maple to calculate, say, an integral, but see the answer to an integral you did not requested? Here is demonstrated a simple way to achieve this.

Each of us can make a typo inadvertently. For example, you mean

```
Maple 9.5.1 > evalf(Int((1-z)*(1+z), z= 0..1));

              .6666666667
```

But in a hurry or somehow you have made a typo… you forgot to put the asterisk, the multiplication sign. Then you see, because Maple do not produce any warning message,

```
Maple 9.5.1 > evalf(Int((1-z)(1+z), z= 0..1));

              .5000000000
```

which is in fact an answer to a different question you did not ask!

```
Maple 9.5.1 > evalf(Int(1-z, z=0..1));

              .5000000000
```

Simple Integrals Maple Cannot Calculate But Competitors Can

NONE of Maple versions can calculate these simple integrals its competitors crack easily.

```
Maple 9.5.1 > int(sqrt(1 - sqrt(1-z)), z= 0..1);

               int((1-(1-z)^(1/2))^(1/2),z = 0 .. 1)

COMMENT:       Mathematica 5.0.1 and Derive 6.1 calculate the integrals correctly.

               INT(SQRT(1 - SQRT(1 - z)), z, 0, 1)
               Integrate[Sqrt[1 - Sqrt[1 - z]], {z, 0, 1}]

               8/15
               8/15
```

GUI and Command Line Math Results Differ

```
Maple V R 5  GUI > int(ln(sin(z)/ln(z)), z= 0..1); evalf(%);

                   -3/2*I*Pi+gamma-I*dilog(exp(I))+1/2*ln(exp(2*I)-1)*Pi+1/2*I*ln(exp(2*I )-
                   1)*Pi-ln(2)+I*dilog(exp(I)+1)-1/2*I-1/2*ln(exp(I)+1)*Pi-1/2*I*ln(exp (I)+
                   1)*Pi+1/12*I*Pi^2

                  -3.756288386-2.025593802*I
```

Maple V R 5 CLI >
```
int(ln(sin(z)/ln(z)), z= 0..1); evalf(%);
```
```
int(ln(sin(z)/ln(z)), z= 0..1)
Error, (in evalf/int) unable to handle singularity
```

This sad situation keeps existing over all the period of Maple's existence. Most recent Maple version example is

Maple 9.5.1 Classic >
```
evalf(Int(floor(z)+1/z, z= 0..1));
```
```
Error, (in evalf/int/control) too many levels of recursion
```

Maple 9.5.1 CLI >
```
evalf(Int(floor(z)+1/z, z= 0..1));
```
```
Float(infinity)
```

Maple 9.5.1 Standard >
```
evalf(Int(floor(z)+1/z, z= 0..1));
```
```
Float(infinity)
```

Standard Worksheets: Persist To Be Raging Headache

Is Maplesoft dishonest?

Up to Maple 8, Interface was quick and fairly usable. The author is compelled to use Standard Worksheets only for studying and analyzing Maple's behaviour. It is painful to read words *User-friendly Tools* in Standard Mode because it sounds a parody, not to say a piece of insulting scoff on the users.

GEMM: Genuine Error Monitor for Maple

Maplesoft Claims Vs Reality

1993-2004: User-Centered Model To Revenue-Centered Model Transition

Howlers: Average Fixtime

---> MAIN FLAWS

INSTABILITY

INCONSISTENCY
INCOMPLETENESS

INTERMITTENT BUGS

……..

……..
……..

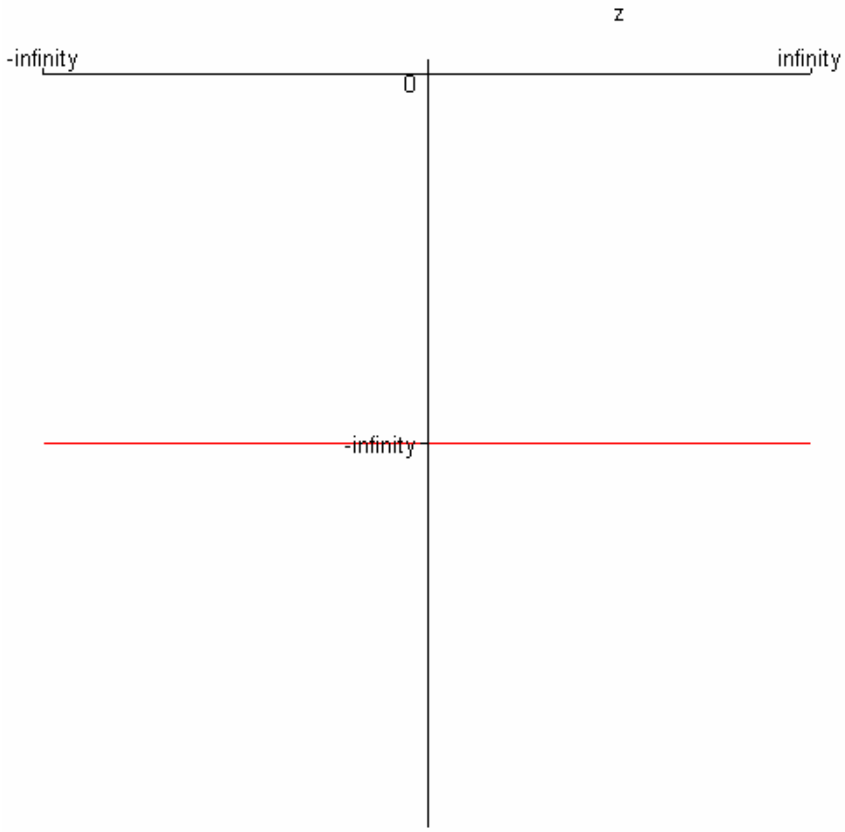
……..

……..

Example 6. 2-D Graphs.

DESCRIPTION: A daring math attempt is made. For the first time on the human's history ln(0) is depicted!

Maple 9.5.1 >**plot(ln(sin(z)-sin(z)),z = -infinity .. infinity);**



……...

Example 1. Help. INVALID EXAMPLE.

?Domains,coding

if not P[Type](a) then errror "2nd argument must be of type P" end if;

……...

Example 2. Help. MISSED HYPERLINK OR REDUNDANT WORD

See the The optionnames are optionsfeasible, optionsexcluded, optionsopen, and optionsclosed.

EXPRESSION: HELP -> plots[inequal]

LOCATION: ?plots,inequal
Line 19 from the top of the page.

ACTUAL: See the The optionnames

EXPECTED: See the The optionnames # A hyperlink is seen after 'See the'

……...

Example 3. Help Search does not find words

……...

Example 4. Help Search displays pages without the searched word.

accessor -> XMLTools[CDataData] - extract an XML CDATA section

……...

Example 5. Help. TYPOS existing over years.

Guassian (!)

Why Maplesoft hates Gauss so much?

1. Guassian

?examples,LA_NAG

fraction-free Guassian elimination

2. antidervative

?examples,Calculus1Integration

learn about antidervative

2. iteratation

?examples,combstruct_sample_structs

some iteratation

3. docecahedron

?networks,dodecahedron

This routine generates the simple graph known as a docecahedron.

COMMENT: http://mathworld.wolfram.com/Dodecahedron.html

4. reachs

?examples,combstruct_sample_structs

number of times reachs the same result

5. fuction

?LinearOperators,IntegrateSols

The LinearOperators[IntegrateSols] fuction performs "accurate integration".

6. compuations

?examples,index

An overview of matrix and vector compuations

7. revoltion

?examples, Calculus1IntApps

the volume of revoltion

8. contditions

?pdsolve,numeric,firstorder

contditions, so often this is best done manually

9. noncommutitive

?examples,LA_Syntax_Shortcuts

noncommutitive multiplication

11. anually

?worksheet,managing,exporttoplaintext

Page break objects inserted anually in Maple

EXPECTED: objects inserted manually in Maple

11. accessor

?examples,obj

by using accessor methods.

10. knowns

?updates,v41

simplify: The simplify command knowns that

11. satisifies

?examples, MapletsStyleGuide

that satisifies the conditions

13. specifiy

?combine,radical

The second is to specifiy the optional argument

12. specifed

?examples, StudentPrecalculus

If a function is specifed but a point is not

13. specifed

?gfun,rectoproc

If params=[a, b, ...] is specifed, the function returns

14. nonhomogenous

?examples,algcurve

The nonhomogenous notation in two variables

15. Attemtping

?updates,Maple7,symbolic
?updates,Maple8,de

Attemtping a differential factorization

Attemtping a differential factorization

16. containting

?readdata

a list containting these names

17. dissallowed

?updates,v52

is dissallowed if a is assigned

?updates,v41

Assignments to builtin functions are dissallowed.

18. circum-sphere

??examples,archi

and r the radius of the circum-sphere.

(1,2,3), radius of the circum-sphere 2, one can use either:

returns the radius of the circum-sphere of gon

19. defered

?examples,ExternalCalling

can be defered to later

20. enantimorphous

an enantimorphous pair having no common part

and 27 are enantimorphous forms

COMMENT: http://www.books.md/E/dic/enantiomorphous.php

21. the the

?dsolve,classical

heunform is the Heun formula (also known as the the improved Euler method).

22. showfuncion

?LinearOperators,IntegrateSols

opts - equation(s) of the form option=value where option is one of
central, derivativeoptions, functionoptions, h, iterations, output,

pointoptions, quotientoptions, showderivative, showfuncion,
showpoints,

23. abitrary

?updatesR4,numeric

with the abitrary precision

……...

Example 6. Quick reference card.

a) Quick reference demon

……...

Example 7. Maple HELP Example does not work.

DESCRIPTION: According to ?fdiscont

```
> fdiscont(abs(x/10000),x=-1..1,0.001);

[]
```

Let us try it by ourselves and see what will happen...

```
Maple 9.5.1> fdiscont(abs(x/10000),x=-1..1,0.001);
                fdiscont(abs(x/10000),x=-1..1,0.001);
        fdiscont(abs(x/10000),x=-1..1,0.001);
        fdiscont(abs(x/10000),x=-1..1,0.001);
        fdiscont(abs(x/10000),x=-1..1,0.001);
        fdiscont(abs(x/10000),x=-1..1,0.001);
        fdiscont(abs(x/10000),x=-1..1,0.001);
        fdiscont(abs(x/10000),x=-1..1,0.001);
        fdiscont(abs(x/10000),x=-1..1,0.001);
        fdiscont(abs(x/10000),x=-1..1,0.001);

        []
        [-.242860592514476274e-3 .. .847016974180350670e-4]
        []
        []
        [-.209572999570237474e-3 .. .227241320283911794e-3]
        [-.243058982449834285e-3 .. .845350036269037256e-4]
        [-.258138132654484554e-3 .. .697892098511788658e-4]
        []
        []
        [-.197831452330330456e-3 .. .239990846661313796e-3]
```

Killin' !

……...

Example 8. 2-D Graphs.

A daring math attempt is made. For the first time on the human's history ln(0) is depicted!

Maple 9.5.1> plot(ln(sin(z)-sin(z)),z = -infinity .. infinity);

A straight line from is displayed.

Maple 9.03 > plot(ln(sin(z)-sin(z)),z = -infinity .. infinity);

Error, (in ln) numeric exception: division by zero

COMMENT: ln(1+sin(z)-sin(z)) = ln(1) = 0

COMPARE: plot(simplify(ln(sin(z)-sin(z))),z=-infinity..infinity);

Error, (in ln) numeric exception: division by zero

The same behaviour with

```
plot(ln(cos(z)-cos(z)),z = -infinity .. infinity);
plot(ln(tan(z)-tan(z)),z = -infinity .. infinity);
plot(ln(sec(z)-sec(z)),z = -infinity .. infinity);
plot(ln(tanh(z)-tanh(z)),z = -infinity .. infinity);
plot(ln(coth(z)-coth(z)),z = -infinity .. infinity);
plot(ln(sech(z)-sech(z)),z = -infinity .. infinity);
plot(ln(csch(z)-csch(z)),z = -infinity .. infinity);
plot(ln(arctan(z)-arctan(z)),z = -infinity .. infinity);
plot(ln(BesselJ(0,z)-BesselJ(0,z)),z = -infinity .. infinity);
plot(ln(BesselJ(0,z)-BesselJ(0,z)),z = -infinity .. infinity);
plot(ln(z!-z!),z = -infinity .. infinity);
```

etc

But Maplesoft did not stop faint-heartedly at this point. Instead,
the company produces for all us a message directed to revolutionize
mathematical science. THE WAY YOU PRODUCED A QUANTITY, COUNTS.

From trail-blazing Maplesoft's view, there are, obviously, subtleties,
depending on how exactly zero has been made. For example,

```
plot(ln(ln(z)-ln(z)),z = -infinity .. infinity);
```

produces a half-line.

Maple 9.5.1> int(Heaviside(I+exp(z)), z= 0..1);
int(Heaviside(I*exp(z)), z= 0..1);

1

1

which is again quite a pathbreakingly because Maple 9.5.1 help
(see ?Dirac) reports that

The Heaviside(t) function is defined as zero for t < 0, 1 for t > 0.

Unfortunately, in Maple 9.5.1 we still see annoying bugs like

Maple 9.5.1> int(Heaviside(I*z), z= 0..1);
Maple 9.5.1> int(Heaviside(I*sqrt(z)), z= 0..1);

Error, (in Heaviside) not defined for non-real values
Error, (in Heaviside) not defined for non-real values

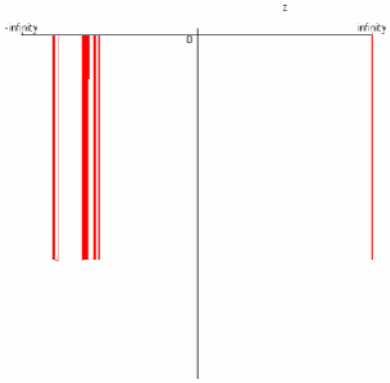
etc but given the good advance bat we are observing currently there are solid grounds to hope that they will be fixed in Maple 10... provided it will be released ever, of cause.

……...

Example 9. 2-D Graphs.

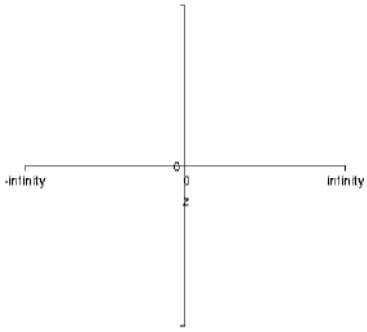
Maple 9.5.1> plot(ln(1+sin(z)-sin(z)),z = -infinity .. infinity);

Several thick vertical lines are displayed. # 2004: Math innovation from Maplesoft.



Maple 9.03 > plot(ln(1+sin(z)-sin(z)),z = -infinity .. infinity);

The axes only are shown. # 2003: Traditional, boring, not innovative.



COMMENT: ln(1+sin(z)-sin(z)) = ln(1) = 0

……...

Example 10. 2-D Graphs.

Maple 9.5.1> plot(arctan(tanh(z)), z= -15..-11);
plot(arctan(tanh(z)), z= -infinity..-11);

Both the graph and the axes are totally absent.
Both the graph and the axes are totally absent.

Maple 9.5.1> plot(cosh(z)^2/sinh(z)^2-1/z^2, z= 0..10000000);

Both the graph and the axes are totally absent.

……...

Example 11. 2-D Graphs.

DESCRIPTION: Only Maple V, Release 3 of 1994 draws this graph correctly.

Maple 9.5.1> plot(exp(arcsech(z)), z= 0..46);

ACTUAL: Plotting error, empty plot

EXPECTED: A smooth concave curve is displayed.

WORKAROUND: plot(convert(exp(arccsch(z)), ln), z= 0..46);

……...

Example 12. 2-D Graphs.

DESCRIPTION: Only Maple V Release 3 of 1994 draws the graph correctly.

Maple 9.5.1> plot((sqrt(1+2*z)-z)/z, z= 0..infinity);

ACTUAL: A spurious vertical segment is drawn near z = infinity.

EXPECTED: The vertical segment near z = infinity is absent.

……...

Example 13. 2-D Graphs.

DESCRIPTION: Only Maple V Release 5 of 1997 and Maple V Release 3 of
1994 draw this graph correctly.

Maple 9.5.1> plot(cosh(z)^2/sinh(z)^2-1/z^2, z= 0..infinity);

ACTUAL: 1) The "infinity" capture is present at the top of the
y-axis.

2) A spurious vertical segment is drawn near z=infinity.

EXPECTED: 1) The "infinity" capture is absent at the top of the y-axis.

2) The vertical segment near z=infinity is absent.

WORKAROUND: plot(convert(cosh(z)^2/sinh(z)^2-1/z^2, coth),\
z= 0..infinity);

HINT: plot(cosh(z)^2/sinh(z)^2-1/z^2, z= 0..100);
plot(cosh(z)^2/sinh(z)^2-1/z^2, z= 0..1000);

……...

Example 14. 2-D Graphs. DUPLICATE

DESCRIPTION: Only Maple V Release 5 of 1997 and Maple V Release 3 of1994 draw this graph correctly.

Maple 9.5.1> plot(AiryBi(1, 1/z), z= 1/27..1);

ACTUAL: The graph is totally absent.

EXPECTED: The graph is displayed automatically.

……...

Example 15. Multiplication.

……...

Example 17. Approximation: factorials.

DESCRIPTION: Only Maple V, Release 5 of 1997 and Maple V, Release 4 of 1995 can approximate this expression correctly.

Maple 9.5.1> restart; evalf(exp(9)!/(exp(18) - exp(9))!);
evalf(evalf(exp(9)!/(exp(18) - exp(9))!,20));

.1935319457e-484676463 # <--- BUG
.2179324416e-484676463

Maple V R 4> restart; evalf(exp(9)!/(exp(18) - exp(9))!);
evalf(evalf(exp(9)!/(exp(18) - exp(9))!,20));

2179439672e-484676473
2179324416e-484676473

COMMENT: Derive 6.1 and Mathematica 5.0.1 approximate this expression (quite) correctly.

```
APPROX(EXP(9)!/(EXP(18) - EXP(9))!)
N[Factorial[Exp[9]]/Factorial[Exp[18] - (Exp[9])]]

2.172567568*10^(- 4.84676464*10^8)
2.179324 10^(-484676464)
```

.....

Example 18. Approximation: factorials.

```
Maple 9.5.1> evalf(exp(9)!/(exp(18) - exp(9))!);
             evalf(exp(10)!/(exp(20) - exp(10))!);

ACTUAL:      .2179324415e-484676463
             0.

EXPECTED:    .2179324416e-484676463
             .2714202821e-4003109365

COMMENT:     Derive 6.1 returns almost a perfect answer.

             2.693202414*10^(-4.003109366*10^9)
```

.....

Example 19. Approximation: elliptic functions.

```
Maple 9.5.1>  evalf(EllipticE(I,I));
              evalf(EllipticE(I,1-I));

              Error, (in evalf/Elliptic/E_M) invalid input: expected evalf[] index to be of
              type posint but received 22+Dm

              3.013959554+1.439713364*I

Maple 8     > evalf(EllipticE(I,I));
              evalf(EllipticE(I,1-I));

              .7119760364*I
              .2367163054+.9341359972*I
```

.....

Example 20. Approximation: elliptic functions.

```
Maple 9.5.1> evalf(EllipticE(I,1+I));

              Maple keeps running after 100,000 seconds

Maple 8     > evalf(EllipticE(I,1+I));

             -.2367163054+.9341359972*I    #  0.331 seconds
```

……...

Example 21. Approximation: elliptic functions.

Maple 9.5.1> evalf(EllipticE(I,sqrt(-I)));

2.441659785+.4473652825*I

= .1277982822+.8981572739*I

CHECKUP: evalf(convert(EllipticE(I,sqrt(-I)), Int));

.1277982822+.8981572739*I

Maple 9.03 > evalf(EllipticE(I,sqrt(-I)));

.1277982822+.8981572739*I

……...

Example 22. Approximation: hypergeometric function.

Maple 9.5.1> evalf(hypergeom([1, -I, 1+I],[2+I, 2-I],1));

Maple keeps running after 40,000 seconds.

4:56 - 22:09 = 5-22= 7 hours

COMMENT: Mathematica 5 approximates this expression instantly.

Timing[N[HypergeometricPFQ[{1,1-I,1+I}, {2-I,2+I}, 1]]]

{0.02 Second, 2.15335}

Timing[N[HypergeometricPFQ[{1,1-I,1+I},{2-I,2+I},1],40]]

{0.02 Second, 2.153348094937162348268101589500000980891}

COMMENT: www.mathworld.com..... approx of hypergeomentric

Maple 9.5.1> evalf(hypergeom([-1/2, -7/20, 3/20],[-1/10, 2/5],1));

Maple keeps running after 40,000 seconds.

Maple 7 > evalf(hypergeom([-1/2, -7/20, 3/20],[-1/10, 2/5],1));

.1239432914 # The result comes in 0.3 seconds

COMMENT: Mathematica 5 approximates this expression instantly.

```
Timing[N[HypergeometricPFQ[{-1/2, -7/20, 3/20}, {-1/10, \
2/5}, 1]]]

{0.04 Second, 0.123943}
```

……...

Example 23. Approximation: MeijerG function.

```
Maple 9.5.1> evalf(MeijerG([[1/4], [1]], [[1/2], [2]], 0));

        Error, (in ln) numeric exception: division by zero

        0
```

HINT: Actually, at z -> 0, MeijerG([[1/4],[1]],[[1/2],[2]], z) = -1/8*2^(1/2)/GAMMA(3/4)*z^(1/2) + O(z^(3/2))

COMMENT: Mathematica 5 approximates this expression correctly.

```
MeijerG[{{1/4}, {1}}, {{1/2}, {2}}, 0] // N

0
```

……...

??? SUPER-STRANGE BUG!

```
evalf(2*2^(1/2)*ln(1+2^(1/2))-1/(1+I)^(3/2)*(-8*EllipticE((1+I)^(1/2),1/2*2^(1/2)-
1/2*I*2^(1/2))+8*EllipticE(1/2*I*(-2-2*I)^(1/2),1/2*2^(1/2)-
1/2*I*2^(1/2))+8*InverseJacobiAM(arcsin((1+I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2))-
8*InverseJacobiAM(I*arcsinh(1/2*(-2-2*I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2))));


s:=mma2m(`2*Sqrt[2]*ArcSinh[1] + (1/(-1 - I)^(3/2))*(8*(-EllipticE[ArcSin[Sqrt[1 + I]], -I] +
EllipticE[I*ArcSinh[Sqrt[-(1/2) - I/2]],
-I] + EllipticF[ArcSin[Sqrt[1 + I]], -I] - EllipticF[I*ArcSinh[Sqrt[-(1/2) - I/2]], -I]))`);

evalf(s);.365869367-.3829294910e-8*I

>s;
2*2^(1/2)*ln(1+2^(1/2))-1/(1+I)^(3/2)*(-8*EllipticE((1+I)^(1/2),1/2*2^(1/2)-
1/2*I*2^(1/2))+8*EllipticE(1/2*I*(-2-2*I)^(1/2),1/2*2^(1/2)-
1/2*I*2^(1/2))+8*InverseJacobiAM(arcsin((1+I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2))-
8*InverseJacobiAM(I*arcsinh(1/2*(-2-2*I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2)))

> evalf(%);
.365869367-.3829294910e-8*I

> evalf(2*2^(1/2)*ln(1+2^(1/2))-1/(1+I)^(3/2)*(-8*EllipticE((1+I)^(1/2),1/2*2^(1/2)-
1/2*I*2^(1/2))+8*EllipticE(1/2*I*(-2-2*I)^(1/2),1/2*2^(1/2)-
```

1/2*I*2^(1/2))+8*InverseJacobiAM(arcsin((1+I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2))-
8*InverseJacobiAM(I*arcsinh(1/2*(-2-2*I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2))));
2.492900956+2.127031593*I

evalf(2*sqrt(2)*arcsinh(1)-1/(1+I)^(3/2)*(-8*EllipticE(sin(arcsin(sqrt(1+I))),sqrt(-I))+8*EllipticE(sin(I*arcsinh(sqrt(-1/2-1/2*I))),sqrt(-I))+8*InverseJacobiAM(arcsin(sqrt(1+I)),sqrt(-I))-8*InverseJacobiAM(I*arcsinh(sqrt(-1/2-1/2*I)),sqrt(-I))));
2*2^(1/2)*ln(1+2^(1/2))-1/(1+I)^(3/2)*(-8*EllipticE((1+I)^(1/2),1/2*2^(1/2)-1/2*I*2^(1/2))+8*EllipticE(1/2*I*(-2-2*I)^(1/2),1/2*2^(1/2)-1/2*I*2^(1/2))+8*InverseJacobiAM(arcsin((1+I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2))-8*InverseJacobiAM(I*arcsinh(1/2*(-2-2*I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2)))

2*2^(1/2)*ln(1+2^(1/2))-1/(1+I)^(3/2)*(-8*EllipticE((1+I)^(1/2),1/2*2^(1/2)-1/2*I*2^(1/2))+8*EllipticE(1/2*I*(-2-2*I)^(1/2),1/2*2^(1/2)-1/2*I*2^(1/2))+8*InverseJacobiAM(arcsin((1+I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2))-8*InverseJacobiAM(I*arcsinh(1/2*(-2-2*I)^(1/2)),1/2*2^(1/2)-1/2*I*2^(1/2)))

restart; int(arcsinh(z)/sqrt(1+z), z= 0..1); evalf(%);

……...

Example 24. Conversion. MeijerG function.

Maple 9.5.1> convert(MeijerG([[],[]],[[1],[]],1.0),StandardFunctions);

Error, (in int/gsum) int/gsum uses a 4th argument, ds,
which is missing

EXPECTED: .3678794412

HINT: convert(MeijerG([[],[]],[[1],[]],1),StandardFunctions);

exp(-1)

.3678794412

COMPARE: convert(MeijerG([[1],[]],[[1],[]],1.0),StandardFunctions);

.5000000000

……...

Example 25. Conversion. Hypergeometric functions.

……...

BUG # XXXXX convert: Error, (in X) numeric exception: division by zero

!!
!!! NONE of Maple version can convert this expression correctly !!!
!!

REGRESSION	NO	
REPRODUCIBLE	ALWAYS	
BUG HISTORY:	PRESENT	Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
	PRESENT	Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
	PRESENT	Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
	PRESENT	Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
	PRESENT	Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
	BUG-1	Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
	BUG-1	Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
	BUG-1	Maple V, Release 5, IBM INTEL NT, Nov 27 1997
	N/A	Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
	N/A	Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

EXPRESSION: convert(hypergeom([],[1, 1/4, 1/4, 1/2, 1/2, 11/4, 11/4], 1), StandardFunctions);

ACTUAL: Error, (in int/flookup/pfddupl/abe) numeric exception: division by zero

EXPECTED: hypergeom([],[1, 1/4, 1/4, 1/2, 1/2, 11/4, 11/4], 1)

9.505611232

CHECKUP: evalf(convert(hypergeom([],[1, 1/4, 1/4, 1/2, 1/2, 11/4, 11/4], 1), MeijerG));

9.505611234+.3506619359e-8*I

COMMENT: BUG-1 = Maple returns

38880765/2596148429267413814265248164610048*BesselI(0,2)-51229647/2596\
148429267413814265248164610048*BesselI(1,2)

.275186724e-26

COMMENT: N/A = Option StandardFunctions is not implemented in this Maple version.

The same bug manifestation with

```
convert(hypergeom([],[2, 9/4, 9/4, 5/2, 5/2, 11/4, 11/4],1),StandardFunctions);
convert(hypergeom([],[1, 9/4, 9/4, 5/2, 5/2, 11/4, 11/4],1),StandardFunctions);
convert(hypergeom([],[1, 1/4, 1/4, 5/2, 5/2, 11/4, 11/4],1),StandardFunctions);
```

……...

Example 26. 1-D integration. CRASH.

……...

Maple 9.5.1> int(ln(z)/sqrt(z^2-3*z+2), z= 1..2);

ACTUAL: LOOPED (standard)

mserver.exe: Exception 0xc00000fd at 0x00245713 (classic)

maple: fatal error, lost connection to kernel (command line interface)

EXPECTED: -2*I*Pi*ln(1/2+1/2*2^(1/2))

-1.182661391*I

WORKAROUND: simplify(int(ln(z+1)/sqrt(z*(z-1)), z= 0..1));

-2*I*Pi*(ln(2^(1/2)+1)-ln(2))

-1.182661391*I

……...

NONE!

Example 27. 1-D quadrature. CRASH.

Maple 9.5.1> evalf(Int(Zeta(0,-1/2,z), z= 0..infinity));

ACTUAL: LOOPED (standard)

mserver.exe: Exception 0xc00000fd at 0x00245713 (classic)

maple: fatal error, lost connection to kernel (command line interface)

EXPECTED: Float(infinity)

CHECKUP: evalf(Int(Zeta(0,-1/2,z), z= 0..10));
evalf(Int(Zeta(0,-1/2,z), z= 0..100));
evalf(Int(Zeta(0,-1/2,z), z= 0..10^10));
evalf(Int(Zeta(0,-1/2,z), z= 0..10^100));

-74.03302271
-26334.14968
-.2666666666e25
-.2666666667e250

HINT: plot(Zeta(0,-1/2,z), z= 0..100);

……...

Example 28. 1-D integration. CRASH.

Maple 9.5.1> int(abs(ln(z)-round(z)), z= 0..infinity);

ACTUAL: LOOPED (standard)

mserver.exe: Exception 0xc00000fd at 0x00245713 (classic)

maple: fatal error, lost connection to kernel (command line interface)

EXPECTED: infinity

CHECKUP: evalf(Int(abs(ln(z)-round(z)), z= 0..1000));

494092.2447

HINT: plot(abs(ln(z)-round(z)), z= 0..infinity);

The same bug manifestation with

int(signum(ln(z)-round(z)), z= 0..infinity);

……...

Example 29. 1-D integration.

DESCRIPTION: Only Maple V Release 5 of 1997 calculates this integral correctly.

Maple 9.5.1> int(arccsc(z), z= 0..1/2);

-1/2*I*Pi+1/2*I*ln(-2*I-I*3^(1/2))-ln(2)+ln(1+I*3^(1/2))

.7853981636+.1348801725*I

Maple V R 5> int(arccsc(z), z= 0..1/2);

-1/6*I*Pi+1/2*arcsin(2)

.7853981635-1.182077724*I

CHECKUP: evalf(Int(arccsc(z), z= 0..1/2));

.7853981634-1.182077724*I

COMMENT: Derive 6, Mathematica 5 and MuPAD 3 calculate this integral correctly.

INT(ACSC(z), z, 0, 1/2)
Integrate[ArcCsc[z], {z, 0, 1/2}]
int(arccsc(z), z= 0..1/2);

pi/4 - #i*(LN(SQRT(3) + 2)/2 + pi/6)
((-I)*Pi+3*ArcSin[2])/6
arctanh(-1/3*I*3^(1/2)) + 1/2*arcsin(2)

0.7853981633 - 1.182077724*#i
0.785398163 - 1.182077724*I

```
        0.7853981634 - 1.182077724*I
```

……...

Example 30. 1-D integration. Orthogonal polynomials.

```
Maple 9.5.1> int(ChebyshevT(0,z), z= 0..1);

        int(ChebyshevT(0,z),z = 0 .. 1)  # <--- BUG

Maple 7    > int(ChebyshevT(0,z), z= 0..1);

        1
```

WORKAROUND: int(expand(ChebyshevT(0,z)), z= 0..1);
int(simplify(ChebyshevT(0,z)), z= 0..1);

```
        1
        1

        with(orthopoly): int(T(0,z), z= 0..1);

        1
```

COMMENT: Mathematica 5 calculates this integral correctly.

```
        Integrate[ChebyshevT[0, z], {z, 0, 1}]

        1
```

……...

Example 31. 1-D integration. Fresh-level integral is not calculated.

DESCRIPTION: Only Maple V, Release 5 of 1997, Maple V, Release 4 of
1995, and Maple V, Release 3 of 1994 can calculate this
integral correctly.

```
Maple 9.5.1> int(1/z^13!, z= 1..infinity);

        Error, (in assuming) when calling `limit/easy`. Received\
        : 'integer too large in context'

Maple V R 5> int(1/z^13!, z= 1..infinity);

        1/6227020799
```

COMMENT: Derive 6 calculates this integral correctly.

```
        INT(1/z^13!, z, 1, inf)

        1/6227020799
```

……

Example 32. 1-D integration. INVALID MAGNITUDE.

DESCRIPTION: NONE Maple version can calculate this integral correctly.

Maple 9.5.1> int(sqrt(-z^2)/z, z= -1..1);

0

= 2*I

……

Example 33. 1-D integration. INVALID MAGNITUDE.

Maple 9.5.1> int(sqrt(-z^5), z= -1..1);

-2/7+2/7*I

-.2857142857+.2857142857*I

Maple 9.03 > int(sqrt(-z^5), z= -1..1);

2/7+2/7*I

.2857142857+.2857142857*I

COMMENT: evalf(Int(sqrt(-z^5), z= -1..1));

.2857142857+.2857142857*I

```
with(Student[Calculus1]):
f:= sqrt(-z^5): alias(quad = ApproximateInt):
evalf(quad(f, z=-1..1, method = newtoncotes[2]));
evalf(quad(f, z=-1..1, method = newtoncotes[10]));
evalf(quad(f, z=-1..1, method = newtoncotes[20]));
evalf(quad(f, z=-1..1, method = random));
evalf(quad(f, z=-1..1, method = trapezoid));
evalf(quad(f, z=-1..1, method = bode));
evalf(quad(f, z=-1..1, method = midpoint));
evalf(quad(f, z=-1..1, method = right));
evalf(quad(f, z=-1..1, method = left));
```

.2857087604+.2857087604*I
.2857142827+.2857142828*I
.285714298+.2857143146*I
.2776048169+.2247389282*I
.2940739264+.2940739264*I
.2857141044+.2857141044*I
.2815261774+.2815261774*I

.1940739264+.3940739264*I
.3940739264+.1940739264*I

……...
Regression to Maple 8.

Example 34. 1-D integration. SIDE EFFECT.

Maple 9.5.1> int(arctan(z), z= 1..I);

-1/4*Pi-3/4*ln(2)+1/2*ln(1+I)

-1.131971754+.3926990817*I

Maple 8 > int(arctan(z), z= 1..I);

-1/4*Pi-1/2*ln(2)

-1.131971754

……...

Example 35. 1-D integration. SIDE EFFECT.

```
Maple 9.5.1> restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);
           restart; int(z^(2/3), z= 1..10): evalf(%);

           51.36152423
           16.72050808
           16.72050808
           16.72050808
           16.72050808
           51.36152423
           16.72050808
```

51.36152423
51.36152423
16.72050808
51.36152423
51.36152423
51.36152423
16.72050808
16.72050808
51.36152423
16.72050808
51.36152423
16.72050808
51.36152423

Maple 8 > restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);
restart; int(z^(2/3), z= 1..10): evalf(%);

27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300
27.24953300

```
27.24953300
27.24953300
27.24953300
27.24953300
```

COMMENT 2: Derive 6, Mathematica 5 and MuPAD 3 calculate this integral correctly, always returning the same answer.

```
INT(z^(1/3)*SQRT(-z), z)
Integrate[z^(1/3) Sqrt[-z], z]
int(z^(1/3)*sqrt(-z), z)

6*z^(4/3)*SQRT(-z)/11
(6/11)*Sqrt[-z]*z^(4/3)
-3/11*(-z)^(11/6)*(I*3^(1/2) + 1)
```

……...

Example 36. 1-D integration.

DESCRIPTION: Maple successfully calculates an integral which has no close form in terms of hypergeometric functions.

```
Maple 9.5.1> int((1+z)^z, z);

        z*hypergeom([1, -z], [2], -z)     # Cliff-hang!

Maple V R 4> int((1+z)^z, z);

        int((1+z)^z, z);
```

CHECKUP:

```
int1 := int((1+z)^z, z):
evalf(limit(int1, z= 2, left) - limit(int1, z= 1, right));
evalf(Int((1+z)^z, z= 1..2));

7.166666667
4.450297635
```

COMPARE:

```
int1 := int((1+z)^2, z):
evalf(limit(int1, z= 2, left) - limit(int1, z= 1, right));
evalf(Int((1+z)^2, z= 1..2));

6.333333333
6.333333333
```

IMPLICATION: Maple cannot calculate definite integrals derived from the original indefinite one.

```
Maple 9.5.1> int((1+z)^z, z=1..2);

        43/6
```

```
        7.166666667

Maple 9.5.1> evalf(Int((1+z)^z, z=1..2));

        4.450297635
```

……...

Example 37. 1-D integration.

DESCRIPTION: Introducing a constant into the integrand results in an invalid answer. Only Maple V, Release 4 of 1995 and Maple V, Release 3 of 1994 can calculates this integral correctly.

```
Maple 9.5.1> int(GAMMA(1/3)/(sqrt(z-1)*z),  z= 1..infinity);

        0

        # = 2/3*Pi^2*3^(1/2)/GAMMA(2/3)

Maple V R 4> int(GAMMA(1/3)/(sqrt(z-1)*z),  z= 1..infinity);

        2/3*Pi^2*3^(1/2)/GAMMA(2/3)
```

……...

Example 38. 1-D integration.

```
Maple 9.5.1> int(z/arcsin(z), z= 0..infinity);

        -1/4*Pi   # <--- BUG

        #  =  infinity+infinity*I
```

……...

Example 39. 1-D integration.

```
Maple 9.5.1> int(abs(ln(z)), z= -1..1);

        -I*Pi+2

        2.-3.141592654*I

        #  1+Pi^2*(StruveH(1, Pi)-BesselY(1, Pi))/2 = 4.409231818
```

……...

Example 40. 1-D integration.

```
Maple 9.5.1> int(arcsec(1-z^2), z= 0..1);
```

```
        -infinity*I

        # = -2*I*ln(2-2^(1/2)) =  1.069599992*I
```

……...

Example 41. 1-D integration.

```
Maple 9.5.1> int(exp(-z)*ln(2-z^3), z= 0..2^(1/3));

        infinity

        # A correct answer is equal to

        1/6*(2*I*Pi+6*exp(2^(1/3))*(Ei(1,RootOf(2+_Z^3,index = 3\
        ))-Ei(1,RootOf(108+_Z^6,index = 6)))+6*exp(2*(-2)^(1/3))\
        *(Ei(1,RootOf(2+_Z^3,index = 1))-Ei(1,RootOf(108+_Z^6,in\
        dex = 1)))+exp(RootOf(-2+_Z^3,index = 2))*(6*gamma-6*Ei(\
        2^(1/3))-2*ln(108))+ln(2^(6*exp((-2)^(1/3)))))/exp((-2)^\
        (1/3))

        .3011733222 + .5582836223e-9*I
```

……...

Example 42. 1-D integration.

```
Maple 9.5.1> int(1/2-FresnelS(sqrt(2*z/Pi)), z= 0..infinity);

        infinity

        # = 1/4
```

……...

Example 43. 1-D integration.

```
Maple 9.5.1> int(z/sec(exp(z)), z= 0..infinity);

        Error, (in int/definite/contour/polypow) numeric
        exception: division by zero

        gamma^2/2-Pi^2/24-hypergeom([1,1,1],[3/2,2,2,2], -1/4)/8

        -.3670785838

        evalf(Int(z/sec(exp(z)), z= 0..10)) + evalf(Int(z/sec(\
        exp(z)), z= 10..12, _Gquad));

        -.3670054599
```

……...

Example 44. 1-D integration.

```
Maple 9.5.1> int(BesselJ(0, z^2+z), z);

        (z^2+z)*BesselJ(0, z^2+z)+1/2*Pi*(z^2+z)*(StruveH(0, z^2\
        +z)*BesselJ(1,z^2+z)-StruveH(1,z^2+z)*BesselJ(0, z^2+z))

Maple V R 3> int(BesselJ(0, z^2+z), z);

        int(BesselJ(0, z^2+z), z);


Maple 9.5.1> evalf(int(BesselJ(0, z^2+z), z= 0..1));
        evalf(Int(BesselJ(0, z^2+z), z= 0..1));

        1.425770294
        .7754594832

Maple V R 3> evalf(int(BesselJ(0, z^2+z), z= 0..1));
        evalf(Int(BesselJ(0, z^2+z), z= 0..1));

        .7754594832
        .7754594832
```

……...

Example 45. 1-D integration.

```
Maple 9.5.1> int(exp(z)*Dirac(z^2-Pi^2), z= -2*Pi..2*Pi);

        0

        # = cosh(Pi)/Pi

COMMENT:    See Poularikas, Transforms And Applications Handbook
        (c) 2000 by CRC Press

COMMENT:    Mathematica 5 calculates this integral correctly.

        Integrate[Exp [z] DiracDelta[z^2 - Pi^2], {z, -2Pi, 2Pi}]

        Cosh[Pi]/Pi
```

……...

Example 46. 1-D integration. COMMUTATIVITY PROPERTY IS BROKEN.

```
Maple 9.5.1> int(Dirac(x)*Dirac(y), x= -infinity..infinity);
        int(Dirac(x)*Dirac(y), y= -infinity..infinity);

        Dirac(y)
```

```
0

# = Dirac(y)
   Dirac(x)
```

COMMENT: Mathematica 5 calculates this integral correctly.

```
Integrate[DiracDelta[x] DiracDelta[y], {x, -Infinity,
 Infinity}]
Integrate[DiracDelta[y] DiracDelta[x], {x, -Infinity,
 Infinity}]

DiracDelta[y]
DiracDelta[y]
```

……...

NONE
Example 47. 1-D integration.

```
Maple 9.5.1> int(ln(1-z)*ln(1-z^2), z= 0..1);

-25/6*Pi^2+ln(2)^2+4*I*ln(2)*Pi-6*I*Pi-2*ln(2)+4

-38.02919304-10.13921156*I
```

EXPECTED: 4-1/6*Pi^2+ln(2)^2-ln(4)

```
1.449224585
```

COMMENT: Derive 6 and Mathematica 5 calculate this integral correctly.

```
INT(LN(1 - z)*LN(1 - z^2), z, 0, 1)
Integrate[Log[1 - z]Log[1 - z^2], {z, 0, 1}]

LN(2)^2 - 2*LN(2) - pi^2/6 + 4
4 - Pi^2/6 + Log[2]^2 - Log[4]

1.449224585
1.44922
```

……...

NONE
Example 48. 1-D integration.

```
Maple 9.5.1> int(sqrt(1+z)*z^(1/3), z= 0..1);

int((1+z)^(1/2)*z^(1/3),z = 0 .. 1)

# = 48/55*2^(1/2)-18/55*hypergeom([1/3, 1/2],[4/3],-1)
```

COMMENT: Mathematica 5 calculates this integral correctly.

```
Integrate[Sqrt[1 + z] z^(1/3), {z, 0, 1}]

(6*(8*Sqrt[2] - 3*Hypergeometric2F1[1/3,1/2,4/3,-1]))/55
```

……...

NONE

Example 49. 1-D integration.

```
Maple 9.5.1> assume(c>0); int(ln(z)/sqrt(z-c), z= 0..c);

        infinity*I

        # = 1-2*I*sqrt(c)*(-2+ln(4)+ln(c))
```

……...

Example 50. 1-D integration.

```
Maple 9.5.1> int(1/(z^5 + 2*z + 1), z= 0..1);

        int(1/(z^5+2*z+1),z = 0 .. 1)

        # = sum(ln(1-1/_R)/(2+5*_R^4), _R= RootOf(1+2*_Z1+_Z1^5))

        .5293203487+0.*I

Maple 8    > int(1/(z^5 + 2*z + 1), z= 0..1);

      sum(_R*ln(564824/625*_R^2+4721/625-5794304/625*_R^4+724288\
      /625*_R^3+93237/625*_R),_R = RootOf(11317*_Z^5-1280*_Z^3-3\
      20*_Z^2-30*_Z-1))-sum(_R*ln(-5794304/625*_R^4+724288/625*_\
      R^3+564824/625*_R^2+93237/625*_R+4096/625),_R = RootOf(113\
      17*_Z^5-1280*_Z^3-320*_Z^2-30*_Z-1))

       .5293203487+0.*I
```

……...

NONE!

Example 51. 1-D integration.

```
Maple 9.5.1> int(sqrt(sqrt(I*z)-1), z= -1..1);

        -2/15*(4*I*2^(1/2)+2*(4-2*2^(1/2)+2*I*2^(1/2))^(1/2)*2^(\
        1/2)+I*(4-2*2^(1/2)+2*I*2^(1/2))^(1/2)*2^(1/2)-2*(4-2*2^\
        (1/2)+2*I*2^(1/2))^(1/2)-4*I*(4-2*2^(1/2)+2*I*2^(1/2))^(\
        1/2)-2*(4-2*2^(1/2)-2*I*2^(1/2))^(1/2)*2^(1/2)+I*(4-2*2^\
        (1/2)-2*I*2^(1/2))^(1/2)*2^(1/2)+2*(4-2*2^(1/2)-2*I*2^(1\
        /2))^(1/2)-4*I*(4-2*2^(1/2)-2*I*2^(1/2))^(1/2))/(2-2^(1/\
```

```
2))^(1/2)

-0.+.4464709715e-1*I
```

EXPECTED: 16/15-4/15*(-22+4*2^(1/2)+2*(452-254*2^(1/2))^(1/2))^(1/2)

```
.6108037573
```

COMMENT: Mathematica 5 calculates this integral correctly.

```
Integrate[Sqrt[Sqrt[I z] - 1], {z, -1, 1}]

16/15+4/15 Sqrt[-1+ -1)^(1/4)] ((3+2*I)+(-1)^(3/4))-(2/1\
5+ 2 I /15 Sqrt[-1-(-1)^(3/4)] ((-1+5 I)+Sqrt[2])

0.610804
```

……...

NONE !

Example 52. 1-D integration.

Maple 9.5.1> int(1/(1+z^2+sqrt(z^2-1)), z= 0..1);

```
-1/56*(112*sum(_R*ln(448*_R^2+6-1792*_R^3+8*_R),_R = Roo\
tOf(6272*_Z^4+140*_Z^2+1))*(2*2^(1/2)+1)^(1/2)-3*ln(1+2^\
(1/2)-(2*2^(1/2)-1)^(1/2))*(2*2^(1/2)-1)^(1/2)*2^(1/2)*(\
2*2^(1/2)+1)^(1/2)-28*arctan((2+(2*2^(1/2)-1)^(1/2))/(2*\
2^(1/2)+1)^(1/2))+2*ln(1+2^(1/2)-(2*2^(1/2)-1)^(1/2))*(2\
*2^(1/2)-1)^(1/2)*(2*2^(1/2)+1)^(1/2)-112*sum(3*_R*ln(2)\
+_R*ln(1-224*_R^3+56*_R^2+_R),_R = RootOf(6272*_Z^4+140*\
_Z^2+1))*(2*2^(1/2)+1)^(1/2)+14*arctan((-2+(2*2^(1/2)-1)\
^(1/2))/(2*2^(1/2)+1)^(1/2))*2^(1/2)+28*arctan((-2+(2*2^\
(1/2)-1)^(1/2))/(2*2^(1/2)+1)^(1/2))+3*ln(1+2^(1/2)+(2*2\
^(1/2)-1)^(1/2))*(2*2^(1/2)-1)^(1/2)*2^(1/2)*(2*2^(1/2)+\
1)^(1/2)-2*ln(1+2^(1/2)+(2*2^(1/2)-1)^(1/2))*(2*2^(1/2)-\
1)^(1/2)*(2*2^(1/2)+1)^(1/2)-14*arctan((2+(2*2^(1/2)-1)^\
(1/2))/(2*2^(1/2)+1)^(1/2))*2^(1/2))/(2*2^(1/2)+1)^(1/2)

1.896150052-0.*I
```

EXPECTED: 1/4*(2*sqrt(5+4*sqrt(2))*arccos(-1/2+1/sqrt(2))+sqrt(-5+\
4*sqrt(2))*(-2*I*Pi+ln(1/2+sqrt(2)-1/2*sqrt(5+4*sqrt(2))\
)))/sqrt(14)

```
.5256774053-.3402439142*I
```

……...

NONE !

Example 53. 1-D integration.

```
Maple 9.5.1> int(cos(z^2+I*z), z= 0..infinity);

ACTUAL:      -1/2*2^(1/2)*Pi^(1/2)*cos(1/4)*FresnelC(1/2*I*2^(1/2)/Pi\
         ^(1/2))+1/2*2^(1/2)*Pi^(1/2)*sin(1/4)*FresnelS(1/2*I*2^(\
         1/2)/Pi^(1/2))-1/4*2^(1/2)*Pi^(1/2)*sin(1/4)+1/4*2^(1/2)\
         *Pi^(1/2)*cos(1/4)

         .4521383779-.4916996772*I

EXPECTED:    undefined

CHECKUP:     seq(evalf(Int(cos(z^2+I*z), z= 0..3^k)), k= 1..4);

         .9693166299    -  2.075762783*I
         -132.4008956   +  180.9393354*I
         825250987.1    +  4856023348.*I
         .4546088393e33 + .9697270266e32*I
```

……...

Example 54. 1-D integration.

```
Maple 9.5.1> int(1/(cos(z)+sin(z)+1), z= 0..infinity);

ACTUAL:      Maple keeps running after 50,000 seconds.

EXPECTED:    Maple returns  undefined  within a fraction of a second.

CHECKUP:     {seq(evalf(Int(1/(cos(z)+sin(z)+1), z=0..k)), k=4..10)};

         {Float(undefined)}

Maple 6    > int(1/(cos(z)+sin(z)+1), z= 0..infinity);

         undefined
```

……...

NONE!

Example 55. 1-D integration. SPURIOUS CONVERGENCE

```
Maple 9.5.1> int(sin((1+I)*z)/z, z= 0..infinity);

ACTUAL:      1/2*Pi

         1.570796327

EXPECTED:    undefined

CHECKUP:     seq(evalf(Int(sin((1+I)*z)/z, z= 0..10^k)), k= 1..4);

         218.4596173      -  788.0752137*I
```

```
-.9256139542e41  + .2357143388e41*I
.1299935139e431  + .6846419504e431*I
.1423701885e4339 - .2769304668e4339*I
```

……...

NONE !

Example 56. 1-D integration.

Maple 9.5.1> int(arctan(tan(1/z)), z= 0..1);

```
Error, (in assuming) when calling `limit/range`. Receive\
d: 'should not happen 33'

1-gamma+ln(Pi/4)

.1812198600
```

……...

NONE ! Maple cannot

Example 57. 1-D integration.

Maple 9.5.1> int(ln(z)/(exp(z) + 2), z=0..infinity);

```
int(ln(z)/(exp(z)+2),z = 0 .. infinity)
```

COMMENT: Mathematica 5 calculates this integral correctly.

```
Integrate[Log[z]/(Exp[z] + 2), {z, 0, Infinity}]

(-EulerGamma Log[3]-Derivative[1,0][PolyLog][1,-2])/2

-0.121223
```

……...

Example 58. 1-D integration.

DESCRIPTION: Only Maple 6 can calculate this integral correctly.

Maple 9.5.1> int(sqrt(z+1/z^2-2), z= 0..1);

```
1/3*(-2*(1+5^(1/2))^(1/2)+4*2^(1/2)*EllipticE(2^(1/2)/(1\
+5^(1/2))^(1/2),I*(1+5^(1/2))^(1/2)/(-1+5^(1/2))^(1/2))-\
6*2^(1/2)*EllipticF(2^(1/2)/(1+5^(1/2))^(1/2),I*(1+5^(1/\
2))^(1/2)/(-1+5^(1/2))^(1/2))-2*2^(1/2)*EllipticF(2^(1/2\
)/(1+5^(1/2))^(1/2),I*(1+5^(1/2))^(1/2)/(-1+5^(1/2))^(1/\
2))*5^(1/2)+3*2^(1/2)*EllipticPi(2^(1/2)/(1+5^(1/2))^(1/\
```

```
2),1/2+1/2*5^(1/2),I*(1+5^(1/2))^(1/2)/(-1+5^(1/2))^(1/2\
))+3*2^(1/2)*EllipticPi(2^(1/2)/(1+5^(1/2))^(1/2),1/2+1/\
2*5^(1/2),I*(1+5^(1/2))^(1/2)/(-1+5^(1/2))^(1/2))*5^(1/2\
))/(1+5^(1/2))^(1/2)

20.05142360-.3477221610e-13*I
```

EXPECTED: infinity

```
Maple 6    > int(sqrt(z+1/z^2-2), z= 0..1);

        infinity
```

……...

NONE ! Maple cannot

Example 59. 1-D integration.

```
Maple 9.5.1> int(z^2/sinh(z), z= 0..infinity);

        7/2*Zeta(3)+limit(-z^2*ln(exp(z)+1)-2*z*polylog(2,-exp(z\
        ))+2*polylog(3,-exp(z))+z^2*ln(1-exp(z))+2*z*polylog(2,e\
        xp(z))-2*polylog(3,exp(z)),z = infinity,left)
```

EXPECTED: 7/2*Zeta(3)

COMMENT: Derive 6.1 and Mathematica 5.0.1 calculate this integral correctly.

```
        INT(z^2/SINH(z), z, 0, inf)
        Integrate[z^2/Sinh[z], {z, 0, Infinity}]

        7*ZETA(3)/2
        7 Zeta[3]/2
```

……...

NONE ! Maple cannot

Example 60. 1-D integration.

DESCRIPTION: Only Maple V, Release 3 of 1994 can calculates this integral correctly.

```
Maple 9.5.1> int(sqrt(ln(-z)), z= 0..1);

        int(ln(-z)^(1/2),z = 0 .. 1)

Maple V R 3> int(sqrt(ln(-z)), z= 0..1);

        -1/2*I*Pi^(1/2)+(I*Pi)^(1/2)-1/2*I*Pi^(1/2)*erf(I*(I*Pi)\
```

```
^(1/2))

1.089290709+1.468546585*I
```

CHECKUP: evalf(Int(sqrt(ln(-z)), z= 0..1));

```
1.089290709+1.468546584*I
```

COMMENT: Mathematica 5 calculates this integral correctly.

```
Integrate[Sqrt[Log[-z]], {z, 0, 1}]

(1+I) Sqrt[Pi/2]-I Sqrt[Pi]+I Sqrt[Pi] Erfc[(I-1)*Sqrt[P\
i/2]]/2

1.08929 + 1.46855 I
```

……...

NONE ! Maple cannot

Example 61. 1-D integration.

DESCRIPTION: Only Maple 8 of 2002, Maple 7 of 2001 and Maple 6 of 2002 can calculate this integral correctly.

Maple 9.5.1> int(1/(z^(5/2) + z + 1), z= 0..1);

```
int(1/(z^(5/2)+z+1),z = 0 .. 1)
```

EXPECTED: 2*sum(ln(1-_R1)/(2+5*_R1^3),_R1=RootOf(_Z^5+_Z^2+1))-2*\
sum(ln(-_R1)/(2+5*_R1^3),_R1=RootOf(_Z^5+_Z^2+1))

```
.6195271602+0.*I
```

COMMENT: Maple returns a user-unreadable, cumbersome answer

```
sum(_R*ln(6/25+36/5*_R^2+_R-12932/25*_R^4-3233/25*_R^3),\
_R = RootOf(3233*_Z^5-45*_Z^3+5*_Z^2+5*_Z-1))+sum(_R*ln(\
44/25-36/5*_R^2+_R+12932/25*_R^4-3233/25*_R^3),_R = Root\
Of(3233*_Z^5-45*_Z^3-5*_Z^2+5*_Z+1))-sum(_R*ln(-76061184\
/5286553*_R^2+23525410/37005871-957912036/37005871*_R^4-\
2631788087/37005871*_R^3-364569887/37005871*_R),_R = Roo\
tOf(3233*_Z^5+527*_Z^3-27*_Z^2+9*_Z-1))-sum(_R*ln(-97105\
46051/7874509*_R^2-109631967/7874509-41606117134/7874509\
*_R^4-4887212945/7874509*_R^3+2322977525/7874509*_R),_R \
= RootOf(3233*_Z^5+707*_Z^3-270*_Z^2+30*_Z-1))-sum(_R*ln\
(_R-12932/25*_R^4-3233/25*_R^3+36/5*_R^2-19/25),_R= Root\
Of(3233*_Z^5-45*_Z^3+5*_Z^2+5*_Z-1))-sum(_R*ln(_R+12932/\
25*_R^4-3233/25*_R^3-36/5*_R^2+19/25),_R = RootOf(3233*_\
Z^5-45*_Z^3-5*_Z^2+5*_Z+1))+sum(_R*ln(-364569887/3700587\
1*_R-957912036/37005871*_R^4-2631788087/37005871*_R^3-76\
```

```
061184/5286553*_R^2-13480461/37005871),_R = RootOf(3233*\
_Z^5+527*_Z^3-27*_Z^2+9*_Z-1))+sum(_R*ln(2322977525/7874\
509*_R-41606117134/7874509*_R^4-4887212945/7874509*_R^3-\
9710546051/7874509*_R^2-117506476/7874509),_R = RootOf(3\
233*_Z^5+707*_Z^3-270*_Z^2+30*_Z-1))

.6195271603+0.*I
```

COMMENT: Mathematica 5 calculates this integral correctly.

```
Integrate[1/(z^(5/2) + z + 1), {z, 0, 1}]

2*(RootSum[1 + #1^2 + #1^5 &, Log[1 - #1]/(2 + 5*#1^3)& \
] - RootSum[1 + #1^2 + #1^5 &, Log[-#1]/(2 + 5*#1^3) & ])

0.619527
```

……...

NONE ! Maple cannot

Example 62. 1-D integration.

DESCRIPTION: Only Maple V Release 4 of 1995 can calculates this integral correctly.

```
Maple 9.5.1> int(1/(3*sin(z)+4*cos(z)-5*sin(z+arcsin(4/5))), z= 0..1);

int(1/(3*sin(z)+4*cos(z)-5*sin(z+arcsin(4/5))),z = 0..1)

Maple V R 4> int(1/(3*sin(z)+4*cos(z)-5*sin(z+arcsin(4/5))), z= 0..1);

Error, (in int) division by zero
```

COMMENT: Derive 6.1 and MuPAD 3.0 calculate this integral correctly.

```
INT(1/(3*SIN(z)+4*COS(z)-5*SIN(z+ASIN(4/5))), z,0,1)

INT("+-"inf, z, 0, 1)


int(1/(3*sin(z)+4*cos(z)-5*sin(z+arcsin(4/5))), z=0..1);

Error: Division by zero [_power];
during evaluation of 'misc::maprec_main'
```

The things are even worse with this non-existent integral as Maple
yields a howler.

```
Maple 9.5.1> int(1/(3*sin(z)+4*cos(z)-5*(sin(z+arcsin(4/5)))),\
z=0..infinity);
```

infinity

while old good Maple V Release 4 of 1995 returns an expected warning

Maple V R 4> int(1/(3*sin(z)+4*cos(z)-5*sin(z+arcsin(4/5))), z= 0..1);

Error, (in int) division by zero

.....

NONE ! Maple cannot

Example 63. 3-D integration. INVALID FEED.

DESCRIPTION: eval and freeze are present at the user's level.

Maple 9.5.1 > **int(int(int(((x*y*z)^(1/7))/(x+y+z), x=0..1), y=0..1), z=0..1);**

```
int(eval(int(7*y*z^2*sum(1/7/_R^6*ln(-_R),_R = `freeze/R19`)+7*y^2*z*
sum(1/7/_R^6*ln(-_R),_R = `freeze/R19`)+7*(y*z)^(1/7)-7*y^2*z*sum(1/7
/_R^6*ln((y*z)^(1/7)-_R),_R = `freeze/R19`)-7*y*z^2*sum(1/7/_R^6*
ln((y*z)^(1/7)-_R),_R = `freeze/R19`),y = 0 .. 1),{`freeze/R19` =
RootOf(_Z^7+y^2*z+y*z^2)}),z = 0 .. 1)
```

Maple 9.5.1 > **evalf(%);**

```
int(-.1431889977e-8*(-349188840.*z^(41/7)*RootOf(_Z^7+y^2*z+ y*z^2)^ 14*ln(z^
(1/7)-1.*RootOf(_Z^7+y^2*z+y*z^2))-4293082794.*z^6*RootOf(_Z^7+y^2*z+y*z^2)^6-
349188840.*z^6*RootOf(_Z^7+y^2*z+y*z^2)^13-43648605.*z^7*RootOf(_Z^7+y^2*z+
y*z^2)^6-232792560.*z^4*RootOf(_Z^7+y^2*z+y*z^2)^20-232792560.*z^(48/7)*ln(-
1.*RootOf(_Z^7+y^2*z+y*z^2))-11639628.*z^(47/7)*RootOf(_Z^7+y^2*z+y*z^2)-
12932920.*z^(45/7)*RootOf(_Z^7+y^2*z+y*z^2)^3-31744440.*z^(52/7)*RootOf(_Z^7+
y^2*z+ y*z^2)^3-116396280.*z^(29/7)*RootOf(_Z^7+y^2*z+y*z^2)^19-116396280.*z^
(44/7)*RootOf(_Z^7+y^2*z+y*z^2)^11-21162960.*z^(38/7)*RootOf(_Z^7+y^2*z+y*z^2
)^10-17907120.*z^(40/7)*RootOf(_Z^7+y^2*z+y*z^2)^8-23279256.*z^(37/7)*RootOf(
_Z^7+y^2*z+y*z^2)^11-87297210.*z^(45/7)*RootOf(_Z^7+y^2*z+y*z^2)^10-34918884.*
z^(51/7)*RootOf(_Z^7+y^2*z+y*z^2)^4-174594420.*z^ (43/7)* RootOf(_Z^7+y^2*
z+y*z^2)^12-58198140.*z^(47/7)*RootOf(_Z^7+y^2*z+y*z^2)^8-14549535.* z^(43/7)*
RootOf(_Z^7+y^2*z+y*z^2)^5-49884120.*z^(48/7)*RootOf(_Z^7+y^2*z+y*z^2)^7-
69837768.*z^(46/7)*RootOf(_Z^7+y^2*z+y*z^2)^9-29099070.*z^(53/7)*RootOf(_Z^7+
y^2*z+y*z^2)^2-25865840.*z^(36/7)*RootOf(_Z^7+y^2*z+y*z^2)^12-349188840.*z^(
55/7)*ln(-1.*RootOf(_Z^7+y^2*z+y*z^2))+ 349188840.*RootOf( _Z^7+y^2*z+ y*z^2)^
14*z^(41/7)*ln(-1.*RootOf(_Z^7+y^2*z+y*z^2))+232792560.*z^(48/7)*ln(z^(1/7)-
1.*RootOf(_Z^7+y^2*z+y*z^2))-11085360.*z^(48/7)-24942060.*z^(55/7)+349188840.*
z^(55/7)*ln(z^(1/7)-1.*RootOf(_Z^7+y^2*z+y*z^2))+232792560.*RootOf(_Z^7+
y^2*z+y*z^2)^21*z^(27/7)*ln(-1.*RootOf(_Z^7+y^2*z+y*z^2))-232792560.*z^
(27/7)*RootOf(_Z^7+y^2*z+y*z^2)^21*ln(z^(1/7)-1.*RootOf(_Z^7+y^2*z+y*z^2))-
29099070.*z^5*RootOf(_Z^7+y^2*z+y*z^2)^13-12252240.*z^(46/7)*RootOf(_Z^7+
y^2*z+y*z^2)^2-26860680.*z^(54/7)*RootOf(_Z^7+y^2*z+y*z^2)-46558512.*z^(32/
7)* RootOf(_Z^7+y^2*z+y*z^2)^16-13693680.*z^(44/7)*RootOf(_Z^7+y^2*z+y*z^2)^4-
38798760.*z^(50/7)*RootOf(_Z^7+y^2*z+y*z^2)^5-16628040.*z^ (41/7)*RootOf(
_Z^7+y^2*z+y*z^2)^7-19399380.*z^(39/7)*RootOf(_Z^7+y^2*z+y*z^2)^9-33256080.*
z^(34/7)*RootOf(_Z^7+y^2*z+y*z^2)^14-38798760.*z^(33/7)* RootOf(_Z^7+ y^2*z+
y*z^2)^15-77597520.*z^(30/7)*RootOf(_Z^7+y^2*z+y*z^2)^18-58198140.*z^ (31/7)*
RootOf(_Z^7+y^2*z+y*z^2)^17)/z^(41/7)/RootOf(_Z^7+y^2*z+y*z^2)^6,z = 0. .. 1.)
```

instead of placid .4767027283 .

……

Example 64. 1-D integration. SPURIOUS ERROR.

Maple 9.5.1 > **int(arctan(tanh(z)), z= 0..1);**

```
Error, (in assuming) when calling `RootOf`. Received: 'leading coefficient
should be invertible'
```

EXPECTED: -Pi/4-Catalan/2+I*(dilog(1+I*exp(2))-dilog(1-I*exp(2)))/4

.3949461990+0.*I

Maple 8 > **int(arctan(tanh(z)), z= 0..1);**

```
-1/2*I*ln(exp(2)-I)-1/2*I*ln(((-I)^(1/2)+exp(1))/(-I)^(1/2))-1/2*I*dilog(1+exp(1)
/(-I)^(1/2))+1/2*I*dilog(1-(1/(-I)^(1/2)))+1/2*I*ln(exp(2)+I)+1/2*I*ln(1-I)-
1/2*I*dilog(1-exp(1)/(-I)^(1/2))+1/2*I*dilog(11/(-I)^(1/2))-1/2*I*dilog(1+(-
1)^(3/4))+1/2*I*ln(1+exp(1)*(-1)^(3/4))+1/2*I*ln(1-exp(1)*(-1)^(3/4))+1/2*I*
dilog(1+exp(1)*(-1)^(3/4))-1/2*I*ln(1+I)-1/2*I*ln(((-I)^(1/2)-exp(1))/(-
I)^(1/2))+1/2*I*dilog(1-exp(1)*(-1)^(3/4))-1/2*I*dilog(1-(-1)^(3/4))
```

Maple 8 > **evalf(%);**

```
.3949462000+.9e-9*I
```

COMMENT: Mathematica 5 calculates this integral correctly.

Integrate[ArcTan[Tanh[z]], {z, 0, 1}]

-Catalan/2 + ArcTan[Tanh[1]] + ArcTan[Tanh[1]] Log[4]/4 - ArcTan[Tanh[1]] Log[(2 I)/(I + E^2)]/2 + ArcTan[Tanh[1]] Log[1/(I + E^2)]/2 - I/4 PolyLog[2, (I - E^2)/(I + E^2)] + I/4 PolyLog[2, (-I + E^2)/(I + E^2)]

0.394946

……

Example 65. 1-D integration. MEANINGLESS OUTPUT.

DESCRIPTION: Summation over _alpha = I instead of summation over _alpha = RootOf(1+_Z^2)) is present in the answer.

Maple 9.5.1> int(sqrt(z)*ln(z)/(1+z), z= 0..1);

```
-2*Sum(-1/6*_alpha*(6*ln(-_alpha)*ln(1/_alpha)+Pi^2),_al\
pha = I)+2*Sum(-_alpha*(dilog(1/_alpha)+ln(1-_alpha)*ln(\
1/_alpha)),_alpha = I)-4
```

```
-2.*Sum(-1/6*_alpha*(6*ln(-_alpha)*ln(1/_alpha)+Pi^2),_a\
lpha = I)+2.*Sum(-_alpha*(dilog(1/_alpha)+ln(1-_alpha)*l\
n(1/_alpha)),_alpha = I)-4.
```

EXPECTED: -4+4*Catalan

```
-.336137623
```

```
Maple 8    > int(sqrt(z)*ln(z)/(1+z), z= 0..1);

-4+2*Sum(-_alpha*(dilog(1/_alpha)+ln(1-_alpha)*ln(1/_alpha\
)),_alpha = RootOf(_Z^2+1))-2*Sum(-1/6*_alpha*(6*ln(-_alph\
a)*ln(1/_alpha)+Pi^2),_alpha = RootOf(_Z^2+1))

-.336137624+0.*I
```

……...

NONE!

Example 66. 1-D integration. INVALID INDEFINITE INTEGRATION.

```
Maple 9.5.1> int(Psi(2, z^(3/2)), z);

2*Psi(1,z^(1/2))*z^(1/2)-2*Psi(z^(1/2))
```

which is invalid because

```
Maple 9.5.1> diff(int(Psi(2, z^(3/2)), z),z);
diff(int(Psi(2, z^(4/3)), z),z);

Psi(2,z^(1/2))
Psi(2,z^(1/3))
```

Even more, Maple returns the same answer for families of integrands...

```
Maple 9.5.1> for j from 1 to 20 by 2 do
print(diff(int(Psi(2, z^(j/2)), z),z)); od;

Psi(2,z^(1/2))
Psi(2,z^(1/2))
Psi(2,z^(1/2))
Psi(2,z^(1/2))
Psi(2,z^(1/2))
Psi(2,z^(1/2))
Psi(2,z^(1/2))
Psi(2,z^(1/2))
Psi(2,z^(1/2))
Psi(2,z^(1/2))
```

```
Maple 9.5.1> for j from 4 to 33 by 3 do
print(diff(int(Psi(2, z^(j/3)), z),z)); od;

Psi(2,z^(1/3))
Psi(2,z^(1/3))
Psi(2,z^(1/3))
```

```
        Psi(2,z^(1/3))
        Psi(2,z^(1/3))
        Psi(2,z^(1/3))
        Psi(2,z^(1/3))
        Psi(2,z^(1/3))
        Psi(2,z^(1/3))
        Psi(2,z^(1/3))

Maple 9.5.1> for j from 1 to 20 by 2 do
        print(diff(int(Psi(3, z^(j/2)), z),z)); od;

        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
        Psi(3,z^(1/2))
```

etc. The implication is that definite integration also invalid here.

```
Maple 9.5.1> int(Psi(2, z^(3/2)), z= 1..2);

        -1/3*Pi^2-2*gamma+2*Psi(1,2^(1/2))*2^(1/2)-2*Psi(2^(1/2))

        -1.489585205

Maple 9.5.1> evalf(Int(Psi(2, z^(3/2)), z= 1..2));

        -.7189170610
```

……...

Example 67. 1-D integration. TOO COMPLICATED ANSWER.

DESCRIPTION: Maple 9 returns an unnecessary sophisticated answer as c\
ompared with all the rest of Maple versions. Even worse,\
a straightforward simplify application does not make t\
he answer as nice as it should be.

```
Maple 9.5.1> int((z*sqrt(3*z^2 + 4) - (z^2 + 1))/((z^2 + 1)*(3*z^2 + \
        4)^(3/2)), z= 0..infinity);

        -1/12/Pi^(1/2)*3^(1/2)*(-3*Pi^(1/2)-4*Pi^(1/2)*3^(1/2)*a\
        rcsin(1/2*3^(1/2))+2*Pi^(3/2)*3^(1/2))+1/8*(-ln(3)+2*ln(\
        2))*Sum((-1)^(2*_k1)*3^_k1*2^(-2*_k1),_k1 = 0 .. infinit\
        y)-1/8/Pi^(1/2)*(8/3*Pi^(1/2)*3^(1/2)+8*Pi^(1/2)*arcsin(\
        1/2*3^(1/2))-4*Pi^(3/2))
```

```
        -.49653191e-3

Maple 8    > int((z*sqrt(3*z^2 + 4) - (z^2 + 1))/((z^2 + 1)*(3*z^2 + \
        4)^(3/2)), z= 0..infinity);

        -1/12*3^(1/2)-1/2*ln(3)+ln(2)

        -.4965312e-3

WORKAROUND:  simplify(subs(Sum=sum, int((z*sqrt(3*z^2+4)-(z^2+1))/((z\
        ^2+1)*(3*z^2+4)^(3/2)), z= 0..infinity)));

        -1/12*3^(1/2)-1/2*ln(3)+ln(2)
```

……...

Example 68. 1-D integration. HUMAN UNREADABLE ANSWER.

DESCRIPTION: Maple output takes 15 screens.

Maple 9.5.1> int(ln(z)/(z^(3/2) + z + 1), z= 0..1);

```
ACTUAL:         1/372*(992*3^(1/2)*arctan(3^(1/2)*((116+12*3^(1/2)*31\
              ^(1/2))^(2/3)-4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)\
              +(116+12*3^(1/2)*31^(1/2))^(2/3)+4))*ln(29+3*3^(1/2)*\
              31^(1/2))-20*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*\
              arctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-\
              16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31\
              ^(1/2))^(2/3)+4))*ln(2)+24*I*3^(1/2)*(116+12*3^(1/2)*\
              31^(1/2))^(1/3)*ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1\
              /2))^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/\
              2)-18*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(\
              116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1\
              /2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(\
              1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31\
              ^(1/2))+1488*I*3^(1/2)*ln(48)*ln(3)-16*I*3^(1/2)*(116\
              +12*3^(1/2)*31^(1/2))^(4/3)*ln(48)*ln(2)+16*I*3^(1/2)\
              *ln(29+3*3^(1/2)*31^(1/2))*(116+12*3^(1/2)*31^(1/2))^\
              (1/3)*ln(9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-\
              3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I*(11\
              6+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1\
              /2)*31^(1/2))^(1/3)*31^(1/2)+36-12*I*31^(1/2))+1488*l\
              n((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(116+12*3^(1/2)\
              *31^(1/2))^(1/3)-I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^\
              (2/3)+4*I*3^(1/2))*ln(48)-216*I*31^(1/2)*ln(-9*I*3^(1\
              /2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*3^(1/\
              2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12*3^(1\
              /2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2))^(1/\
              3)*31^(1/2)+36+12*I*31^(1/2))*ln(9*(116+12*3^(1/2)*31\
              ^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)\
              *31^(1/2)-18-2*3^(1/2)*31^(1/2))+992*3^(1/2)*Pi*ln(29\
              +3*3^(1/2)*31^(1/2))-1488*3^(1/2)*Pi*ln(9*(116+12*3^(\
```

```
1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*\
3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))+10*I*3^(1/2)*\
(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(9*I*3^(1/2)*(116+1\
2*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2\
))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3\
)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2\
)+36-12*I*31^(1/2))*ln(2)-48*I*3^(1/2)*(116+12*3^(1/2\
)*31^(1/2))^(1/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+\
4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2)*(116+12\
*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48-6*I*(116+\
12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1\
/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/\
2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3\
)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*\
31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12\
*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2\
/3)*3^(1/2)*31^(1/2))+1488*3^(1/2)*arctan(((116+12*3^\
(1/2)*31^(1/2))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^\
(1/2))^(1/3)-2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)\
+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-\
2*3^(1/2)*31^(1/2))-1488*I*3^(1/2)*ln((116+12*3^(1/2)\
*31^(1/2))^(2/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2)\
)*ln(48)+3*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*\
ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(\
116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*\
(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))*ln(12)-1488\
*3^(1/2)*Pi*ln(12)+2976*3^(1/2)*Pi*ln(3)+2976*3^(1/2)\
*arctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(\
-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*3\
1^(1/2))^(2/3)+4))*ln(3)-160*3^(1/2)*(116+12*3^(1/2)*\
31^(1/2))^(1/3)*Pi*ln(2)+128*I*3^(1/2)*(116+12*3^(1/2\
)*31^(1/2))^(1/3)*ln(2)*ln(48-6*I*(116+12*3^(1/2)*31^\
(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^\
(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(\
2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(\
116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(1\
16+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1\
/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31\
^(1/2))-1488*dilog(12*(116+12*3^(1/2)*31^(1/2))^(1/3)\
/((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(116+12*3^(1/2)\
*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^\
(2/3)-4*I*3^(1/2)))-48*I*3^(1/2)*(116+12*3^(1/2)*31^(\
1/2))^(1/3)*ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))\
^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-1\
8*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+\
12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))\
*ln(3)+6*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*arct\
an(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-16*(\
116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/\
2))^(2/3)+4))*ln(12)-6*I*3^(1/2)*(116+12*3^(1/2)*31^(\
```

```
1/2))^(4/3)*ln(48)*ln(3)-32*3^(1/2)*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*Pi*ln(29+3*3^(1/2)*31^(1/2))+432*I*31^\
(1/2)*ln(48)*ln(3)+128*(116+12*3^(1/2)*31^(1/2))^(1/3\
)*ln(48-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+\
18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1\
/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/\
2)*31^(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(\
1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2))*ln(2)+48*3^(1/\
2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*arctan(3^(1/2)*((1\
16+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-16*(116+12*3^(1/2)\
*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(2/3)+4))*\
ln(12)-432*I*31^(1/2)*ln((116+12*3^(1/2)*31^(1/2))^(2\
/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2)*(11\
6+12*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48)+432*\
31^(1/2)*arctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3\
^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))*ln(9*(116\
+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))\
^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))-48*3^(\
1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*arctan(((116+12*\
3^(1/2)*31^(1/2))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*3\
1^(1/2))^(1/3)-2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/\
3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-1\
8-2*3^(1/2)*31^(1/2))+16*I*3^(1/2)*(116+12*3^(1/2)*31\
^(1/2))^(1/3)*ln(29+3*3^(1/2)*31^(1/2))*ln(48-6*I*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^\
(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(\
1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2\
/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2\
)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+\
12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^\
(2/3)*3^(1/2)*31^(1/2))+24*I*3^(1/2)*(116+12*3^(1/2)*\
31^(1/2))^(1/3)*ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1\
/2))^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/\
2)-18*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(\
116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1\
/2))*ln(12)-I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)\
*Pi^2-48*(116+12*3^(1/2)*31^(1/2))^(1/3)*dilog(12*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)/((116+12*3^(1/2)*31^(1/2\
))^(2/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2\
)*(116+12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2)))-432*I\
*31^(1/2)*dilog((-(116+12*3^(1/2)*31^(1/2))^(2/3)-4+1\
6*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3\
^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2))/(-(116+12*3^(1/2)\
*31^(1/2))^(2/3)-4+4*(116+12*3^(1/2)*31^(1/2))^(1/3)+\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2)\
))+1488*ln(48-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^\
(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12\
*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31\
```

```
^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+\
12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2))*ln(3)+14\
4*3^(1/2)*31^(1/2)*ln(48-6*I*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)\
*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-\
3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(116+1\
2*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(116+12\
*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1/2))^\
(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2\
))*ln(3)+384*3^(1/2)*31^(1/2)*ln(2)*ln(48-6*I*(116+12\
*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2\
)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)\
*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*\
31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31\
^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3\
^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3\
)*3^(1/2)*31^(1/2))+6*(116+12*3^(1/2)*31^(1/2))^(4/3)\
*ln(48-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+1\
8*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/\
2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2\
)*31^(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))\
^(1/3)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1\
/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2))*ln(3)-432*I*31^\
(1/2)*ln(9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-\
3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1\
/2)*31^(1/2))^(1/3)*31^(1/2)+36-12*I*31^(1/2))*ln(3)+\
432*I*31^(1/2)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4\
*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2)*(116+12*3^\
(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48-6*I*(116+12*\
3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)\
*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*\
31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*3\
1^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^\
(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^\
(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)\
*3^(1/2)*31^(1/2))+16*(116+12*3^(1/2)*31^(1/2))^(1/3)\
*ln(29+3*3^(1/2)*31^(1/2))*ln(48-6*I*(116+12*3^(1/2)*\
31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2)\
)^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+\
2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18\
*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*31\
^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)\
*31^(1/2))+216*I*31^(1/2)*ln(9*I*3^(1/2)*(116+12*3^(1\
/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/\
3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1\
/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36-1\
2*I*31^(1/2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(1\
16+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3\
^(1/2)*31^(1/2))+48*(116+12*3^(1/2)*31^(1/2))^(1/3)*l\
```

```
n(48-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*\
I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)\
*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*\
31^(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^\
(1/3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(\
1/3)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2\
)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2))*ln(3)-288*3^(1/2)\
*31^(1/2)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116\
+12*3^(1/2)*31^(1/2))^(1/3))*ln(3)+48*3^(1/2)*31^(1/2\
)*ln(29+3*3^(1/2)*31^(1/2))*ln(9*(116+12*3^(1/2)*31^(\
1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*3\
1^(1/2)-18-2*3^(1/2)*31^(1/2))+240*3^(1/2)*31^(1/2)*l\
n(2)*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(\
1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31\
^(1/2))+144*3^(1/2)*31^(1/2)*ln(3)*ln(9*(116+12*3^(1/\
2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^\
(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))-12*I*(116+12*3^\
(1/2)*31^(1/2))^(4/3)*Pi*ln((116+12*3^(1/2)*31^(1/2))\
^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))-96*I*Pi*l\
n((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)\
*31^(1/2))^(1/3))*(116+12*3^(1/2)*31^(1/2))^(1/3)+12*\
I*(116+12*3^(1/2)*31^(1/2))^(4/3)*Pi*ln((116+12*3^(1/\
2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1/3)+\
4)+96*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*Pi*ln((116+12\
*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^\
(1/3)+4)-12*(116+12*3^(1/2)*31^(1/2))^(4/3)*dilog(((1\
16+12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1\
/2))^(1/3)+4)/((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(1\
16+12*3^(1/2)*31^(1/2))^(1/3)))-2976*ln((116+12*3^(1/\
2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3\
))*ln(24)-2480*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-7\
6-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3\
)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))*l\
n(2)-1488*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3\
^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln(3)+\
744*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)\
*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3\
^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln(9*(116+12\
*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1\
/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))+(116+12*3\
^(1/2)*31^(1/2))^(4/3)*Pi^2+8*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*Pi^2+4960*ln((116+12*3^(1/2)*31^(1/2))^(2/3)\
+8*(116+12*3^(1/2)*31^(1/2))^(1/3)+4)*ln(2)+992*ln((1\
16+12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1\
/2))^(1/3)+4)*ln(29+3*3^(1/2)*31^(1/2))-2976*ln((116+\
12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)+4)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(11\
6+12*3^(1/2)*31^(1/2))^(1/3))-96*(116+12*3^(1/2)*31^(\
1/2))^(1/3)*dilog(((116+12*3^(1/2)*31^(1/2))^(2/3)+8*\
(116+12*3^(1/2)*31^(1/2))^(1/3)+4)/((116+12*3^(1/2)*3\
1^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3)))+\
```

```
96*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln((116+12*3^(1/2)\
*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1/3)+4)\
*ln(3)-16*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(48)*ln(2\
)-6*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(48)*ln(3)-2*(1\
16+12*3^(1/2)*31^(1/2))^(4/3)*ln(29+3*3^(1/2)*31^(1/2\
))*ln(48)-96*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln((116+\
12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/\
2))^(1/3))*ln(3)+80*(116+12*3^(1/2)*31^(1/2))^(1/3)*l\
n(2)*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(\
1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31\
^(1/2))+48*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(3)*ln(9\
*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(\
1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))-1\
2*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln((116+12*3^(1/2)*\
31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*\
ln(3)+16*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(29+3*3^(1\
/2)*31^(1/2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(1\
16+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3\
^(1/2)*31^(1/2))-128*(116+12*3^(1/2)*31^(1/2))^(1/3)*\
ln(48)*ln(2)-48*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(48\
)*ln(3)-16*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(29+3*3^\
(1/2)*31^(1/2))*ln(48)-2976*I*Pi*ln((116+12*3^(1/2)*3\
1^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))+2\
4*3^(1/2)*31^(1/2)*Pi^2-20*(116+12*3^(1/2)*31^(1/2))^\
(4/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*\
3^(1/2)*31^(1/2))^(1/3))*ln(2)-4*(116+12*3^(1/2)*31^(\
1/2))^(4/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(1\
16+12*3^(1/2)*31^(1/2))^(1/3))*ln(29+3*3^(1/2)*31^(1/\
2))-2976*I*Pi*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)\
+(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*\
(116+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^\
(1/2))^(1/3)*3^(1/2)*31^(1/2))-2976*dilog(((116+12*3^\
(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1/\
3)+4)/((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^\
(1/2)*31^(1/2))^(1/3)))-744*ln(9*(116+12*3^(1/2)*31^(\
1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*3\
1^(1/2)-18-2*3^(1/2)*31^(1/2))^2+2976*ln((116+12*3^(1\
/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/\
3))^2-288*I*Pi*3^(1/2)*31^(1/2)*ln((116+12*3^(1/2)*31\
^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))+16\
0*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln((116+12*3^(1/2)*\
31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1/3)+4)*\
ln(2)+32*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln((116+12*3\
^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1\
/3)+4)*ln(29+3*3^(1/2)*31^(1/2))-96*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+8*(\
116+12*3^(1/2)*31^(1/2))^(1/3)+4)*ln((116+12*3^(1/2)*\
31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))-\
32*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln((116+12*3^(1/2)\
*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))\
*ln(29+3*3^(1/2)*31^(1/2))+96*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*ln(24)*ln(3)-160*(116+12*3^(1/2)*31^(1/2))^(\
```

```
1/3)*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12*\
3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3\
^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1\
/3)*3^(1/2)*31^(1/2))*ln(2)-96*(116+12*3^(1/2)*31^(1/\
2))^(1/3)*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(11\
6+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116\
+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*3^(1/2)*31^(1/2))*ln(3)+32*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*ln(29+3*3^(1/2)*31^(1/2))*ln(24)-32*(1\
16+12*3^(1/2)*31^(1/2))^(1/3)*ln(29+3*3^(1/2)*31^(1/2\
))*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12*3^\
(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3^(\
1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1/3\
)*3^(1/2)*31^(1/2))+20*(116+12*3^(1/2)*31^(1/2))^(4/3\
)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2\
)*31^(1/2))^(1/3)+4)*ln(2)+4*(116+12*3^(1/2)*31^(1/2)\
)^(4/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*\
3^(1/2)*31^(1/2))^(1/3)+4)*ln(29+3*3^(1/2)*31^(1/2))-\
12*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln((116+12*3^(1/2)\
*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1/3)+4)\
*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/\
2)*31^(1/2))^(1/3))+2976*I*Pi*ln((116+12*3^(1/2)*31^(\
1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1/3)+4)-160*\
(116+12*3^(1/2)*31^(1/2))^(1/3)*ln((116+12*3^(1/2)*31\
^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*ln\
(2)+288*3^(1/2)*31^(1/2)*ln((116+12*3^(1/2)*31^(1/2))\
^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))^2-96*(116\
+12*3^(1/2)*31^(1/2))^(1/3)*ln((116+12*3^(1/2)*31^(1/\
2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*ln(24)\
+160*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(24)*ln(2)+96*\
(116+12*3^(1/2)*31^(1/2))^(1/3)*ln((116+12*3^(1/2)*31\
^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*ln\
(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12*3^(1/2)\
*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3^(1/2)*\
31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(\
1/2)*31^(1/2))+20*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(\
24)*ln(2)+12*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(24)*l\
n(3)-20*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(24-9*(116+\
12*3^(1/2)*31^(1/2))^(2/3)+(116+12*3^(1/2)*31^(1/2))^\
(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3^(1/2)*31^(1/2))^(\
1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/\
2))*ln(2)-12*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(24-9*\
(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12*3^(1/2)*31^(1\
/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3^(1/2)*31^(1/\
2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*3\
1^(1/2))*ln(3)-4*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(2\
9+3*3^(1/2)*31^(1/2))*ln(24-9*(116+12*3^(1/2)*31^(1/2\
))^(2/3)+(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(\
1/2)+18*(116+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(\
1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))-12*(116+12*3^(\
1/2)*31^(1/2))^(4/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/\
3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*ln(24)+12*(11\
```

```
6+12*3^(1/2)*31^(1/2))^(4/3)*ln((116+12*3^(1/2)*31^(1\
/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*ln(24\
-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12*3^(1/2)*31\
^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3^(1/2)*31^\
(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2\
)*31^(1/2))+4*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(29+3\
*3^(1/2)*31^(1/2))*ln(24)-16*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)*ln(29+3*3^(1/2)*31^(1/2))*ln(5*(116+12*3^(1/2\
)*31^(1/2))^(2/3)-76-8*3^(1/2)*31^(1/2)+7*(116+12*3^(\
1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*\
3^(1/2)*31^(1/2))+24*(116+12*3^(1/2)*31^(1/2))^(1/3)*\
ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*31^\
(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/\
2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln(12)+24*(116+1\
2*3^(1/2)*31^(1/2))^(1/3)*ln(5*(116+12*3^(1/2)*31^(1/\
2))^(2/3)-76-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^\
(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*\
31^(1/2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+1\
2*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/\
2)*31^(1/2))+12*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln((1\
16+12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1\
/2))^(1/3)+4)*ln(3)+480*3^(1/2)*31^(1/2)*ln((116+12*3\
^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1\
/3)+4)*ln(2)+96*3^(1/2)*31^(1/2)*ln((116+12*3^(1/2)*3\
1^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^(1/3)+4)*l\
n(29+3*3^(1/2)*31^(1/2))-288*3^(1/2)*31^(1/2)*ln((116\
+12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2\
))^(1/3)+4)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(1\
16+12*3^(1/2)*31^(1/2))^(1/3))+12*I*(116+12*3^(1/2)*3\
1^(1/2))^(4/3)*Pi*ln(24)-12*I*(116+12*3^(1/2)*31^(1/2\
))^(4/3)*Pi*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(\
116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(1\
16+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1\
/2))^(1/3)*3^(1/2)*31^(1/2))+96*I*(116+12*3^(1/2)*31^\
(1/2))^(1/3)*Pi*ln(24)-96*I*(116+12*3^(1/2)*31^(1/2))\
^(1/3)*Pi*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(11\
6+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116\
+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*3^(1/2)*31^(1/2))-480*3^(1/2)*31^(1/2)*ln((1\
16+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^\
(1/2))^(1/3))*ln(2)-96*3^(1/2)*31^(1/2)*ln((116+12*3^\
(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(\
1/3))*ln(29+3*3^(1/2)*31^(1/2))+480*3^(1/2)*31^(1/2)*\
ln(24)*ln(2)+288*3^(1/2)*31^(1/2)*ln(24)*ln(3)-480*3^\
(1/2)*31^(1/2)*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3\
)+(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18\
*(116+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31\
^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln(2)-288*3^(1/2)*31^\
(1/2)*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12\
*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*\
3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(\
1/3)*3^(1/2)*31^(1/2))*ln(3)+96*3^(1/2)*31^(1/2)*ln(2\
```

```
9+3*3^(1/2)*31^(1/2))*ln(24)-96*3^(1/2)*31^(1/2)*ln(2\
9+3*3^(1/2)*31^(1/2))*ln(24-9*(116+12*3^(1/2)*31^(1/2\
))^(2/3)+(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(\
1/2)+18*(116+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(\
1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))-240*3^(1/2)*31\
^(1/2)*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1\
/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+1\
2*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln(2)-144\
*3^(1/2)*31^(1/2)*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3\
)-76-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(\
1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)\
)*ln(3)-48*3^(1/2)*31^(1/2)*ln(29+3*3^(1/2)*31^(1/2))\
*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*31\
^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1\
/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))+288*3^(1/2)*31^\
(1/2)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*\
3^(1/2)*31^(1/2))^(1/3))*ln(24-9*(116+12*3^(1/2)*31^(\
1/2))^(2/3)+(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*3\
1^(1/2)+18*(116+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*\
3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))-384*3^(1/2)\
*31^(1/2)*ln(2)*ln(48)-48*3^(1/2)*31^(1/2)*ln(29+3*3^\
(1/2)*31^(1/2))*ln(48)-144*3^(1/2)*31^(1/2)*ln(48)*ln\
(3)-288*3^(1/2)*31^(1/2)*ln((116+12*3^(1/2)*31^(1/2))\
^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*ln(24)-72\
*3^(1/2)*31^(1/2)*ln(12)*ln(9*(116+12*3^(1/2)*31^(1/2\
))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(\
1/2)-18-2*3^(1/2)*31^(1/2))+72*3^(1/2)*31^(1/2)*ln(5*\
(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*31^(1/2)\
+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31\
^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln(9*(116+12*3^(1/2)*\
31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/\
2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))+288*3^(1/2)*31^(1/\
2)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/\
2)*31^(1/2))^(1/3)+4)*ln(3)+72*3^(1/2)*31^(1/2)*ln(5*\
(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*31^(1/2)\
+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31\
^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln(12)+288*I*Pi*3^(1/\
2)*31^(1/2)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+8*(116\
+12*3^(1/2)*31^(1/2))^(1/3)+4)-288*I*3^(1/2)*31^(1/2)\
*Pi*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12*3\
^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3^\
(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1/\
3)*3^(1/2)*31^(1/2))+288*I*3^(1/2)*31^(1/2)*Pi*ln(24)\
-4960*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12\
*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*\
3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(\
1/3)*3^(1/2)*31^(1/2))*ln(2)+992*ln(29+3*3^(1/2)*31^(\
1/2))*ln(24)-992*ln(29+3*3^(1/2)*31^(1/2))*ln(24-9*(1\
16+12*3^(1/2)*31^(1/2))^(2/3)+(116+12*3^(1/2)*31^(1/2\
))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^\
(1/2))-2976*ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(\
```

```
116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(1\
16+12*3^(1/2)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1\
/2))^(1/3)*3^(1/2)*31^(1/2))*ln(3)+96*(116+12*3^(1/2)\
*31^(1/2))^(1/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4\
+2*(116+12*3^(1/2)*31^(1/2))^(1/3))^2+2976*ln((116+12\
*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31^(1/2))^\
(1/3)+4)*ln(3)-496*ln(29+3*3^(1/2)*31^(1/2))*ln(5*(11\
6+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*31^(1/2)+7*\
(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1\
/2))^(1/3)*3^(1/2)*31^(1/2))+2976*ln((116+12*3^(1/2)*\
31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*\
ln(24-9*(116+12*3^(1/2)*31^(1/2))^(2/3)+(116+12*3^(1/\
2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2)+18*(116+12*3^(1/2\
)*31^(1/2))^(1/3)-2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3\
^(1/2)*31^(1/2))+744*ln(5*(116+12*3^(1/2)*31^(1/2))^(\
2/3)-76-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1\
/2))*ln(12)-24*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(9*(\
116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/\
2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))^2-3\
*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(9*(116+12*3^(1/2)\
*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1\
/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))^2+2480*ln(2)*ln(9\
*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(\
1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))+4\
96*ln(29+3*3^(1/2)*31^(1/2))*ln(9*(116+12*3^(1/2)*31^\
(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*\
31^(1/2)-18-2*3^(1/2)*31^(1/2))-744*ln(12)*ln(9*(116+\
12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^\
(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))-2976*ln\
((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*\
31^(1/2))^(1/3))*ln(3)+1488*ln(3)*ln(9*(116+12*3^(1/2\
)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(\
1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))-4960*ln((116+12*\
3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/2))\
^(1/3))*ln(2)-992*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+\
4+2*(116+12*3^(1/2)*31^(1/2))^(1/3))*ln(29+3*3^(1/2)*\
31^(1/2))+12*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln((116+\
12*3^(1/2)*31^(1/2))^(2/3)+4+2*(116+12*3^(1/2)*31^(1/\
2))^(1/3))^2-496*ln(29+3*3^(1/2)*31^(1/2))*ln(48)-24*\
(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(12)*ln(9*(116+12*3\
^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3\
)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))-72*3^(1/2)*\
31^(1/2)*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12\
*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2\
)*31^(1/2))^2-3*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(12\
)*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2\
)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1\
/2))+2*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(29+3*3^(1/2\
)*31^(1/2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116\
+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(\
1/2)*31^(1/2))+10*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(\
```

```
2)*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/\
2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(\
1/2))+6*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(3)*ln(9*(1\
16+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2\
))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))-10*(\
116+12*3^(1/2)*31^(1/2))^(4/3)*ln(5*(116+12*3^(1/2)*3\
1^(1/2))^(2/3)-76-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2\
)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(\
1/2)*31^(1/2))*ln(2)-6*(116+12*3^(1/2)*31^(1/2))^(4/3\
)*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*3\
1^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(\
1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln(3)-48*(116+\
12*3^(1/2)*31^(1/2))^(1/3)*ln(5*(116+12*3^(1/2)*31^(1\
/2))^(2/3)-76-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31\
^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)\
*31^(1/2))*ln(3)-2*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln\
(29+3*3^(1/2)*31^(1/2))*ln(5*(116+12*3^(1/2)*31^(1/2)\
)^(2/3)-76-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1\
/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31\
^(1/2))+3*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(5*(116+1\
2*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*31^(1/2)+7*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2)\
)^(1/3)*3^(1/2)*31^(1/2))*ln(12)+3*(116+12*3^(1/2)*31\
^(1/2))^(4/3)*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76\
-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)\
+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))*ln\
(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31\
^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))\
-80*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(5*(116+12*3^(1\
/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*31^(1/2)+7*(116+12*3\
^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3\
)*3^(1/2)*31^(1/2))*ln(2)-288*3^(1/2)*31^(1/2)*dilog(\
((116+12*3^(1/2)*31^(1/2))^(2/3)+8*(116+12*3^(1/2)*31\
^(1/2))^(1/3)+4)/((116+12*3^(1/2)*31^(1/2))^(2/3)+4+2\
*(116+12*3^(1/2)*31^(1/2))^(1/3)))+6*3^(1/2)*(116+12*\
3^(1/2)*31^(1/2))^(4/3)*Pi*ln(12)+48*3^(1/2)*(116+12*\
3^(1/2)*31^(1/2))^(1/3)*arctan(3^(1/2)*((116+12*3^(1/\
2)*31^(1/2))^(2/3)-4)/(-16*(116+12*3^(1/2)*31^(1/2))^\
(1/3)+(116+12*3^(1/2)*31^(1/2))^(2/3)+4))*ln(9*(116+1\
2*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(\
1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))+48*3^(1/\
2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*arctan(((116+12*3^\
(1/2)*31^(1/2))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^\
(1/2))^(1/3)-2))*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)\
-76-8*3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1\
/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))\
-10*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(2)*l\
n(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(1\
16+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(\
116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31\
^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))+6*(116+12*3^\
(1/2)*31^(1/2))^(4/3)*ln((116+12*3^(1/2)*31^(1/2))^(2\
```

```
/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2)*(11\
6+12*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48)-48*I\
*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(48)*ln(3)\
-3968*I*3^(1/2)*ln(2)*ln(48-6*I*(116+12*3^(1/2)*31^(1\
/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1\
/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/\
3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(116\
+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1/2\
))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(\
1/2))+432*I*31^(1/2)*ln(-9*I*3^(1/2)*(116+12*3^(1/2)*\
31^(1/2))^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*3\
1^(1/2)-18*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)+\
6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36+12*I*\
31^(1/2))*ln(3)+144*I*3^(1/2)*31^(1/2)*arctan(((116+1\
2*3^(1/2)*31^(1/2))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)\
*31^(1/2))^(1/3)-2))*ln(9*I*3^(1/2)*(116+12*3^(1/2)*3\
1^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31\
^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)-6\
*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36-12*I*3\
1^(1/2))-12*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*P\
i*ln(3)+6*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*l\
n(9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(11\
6+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^\
(1/2)*31^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^\
(1/2))^(1/3)*31^(1/2)+36-12*I*31^(1/2))*ln(3)+144*I*3\
1^(1/2)*ln(29+3*3^(1/2)*31^(1/2))*ln(48)+80*I*3^(1/2)\
*ln(2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(9*I*3^(1/2)\
*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*\
31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*\
31^(1/2)+36-12*I*31^(1/2))-6*3^(1/2)*(116+12*3^(1/2)*\
31^(1/2))^(4/3)*arctan(((116+12*3^(1/2)*31^(1/2))^(1/\
3)+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))*ln\
(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31\
^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))\
-32*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*arctan(3^\
(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-16*(116+1\
2*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(\
2/3)+4))*ln(29+3*3^(1/2)*31^(1/2))-48*(116+12*3^(1/2)\
*31^(1/2))^(1/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4\
-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2)*(116+12*\
3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48-6*I*(116+1\
2*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/\
2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2\
)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)\
*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*3\
1^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*\
3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/\
3)*3^(1/2)*31^(1/2))+248*Pi^2+2976*I*Pi*ln(24)-6*(116\
+12*3^(1/2)*31^(1/2))^(4/3)*dilog(12*(116+12*3^(1/2)*\
31^(1/2))^(1/3)/((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*\
```

```
(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(\
1/2)*31^(1/2))^(2/3)-4*I*3^(1/2)))-2976*arctan(3^(1/2\
)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-16*(116+12*3^\
(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(2/3)\
+4))*arctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3^(1/\
2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))+6*3^(1/2)*(11\
6+12*3^(1/2)*31^(1/2))^(4/3)*arctan(((116+12*3^(1/2)*\
31^(1/2))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))\
^(1/3)-2))*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*\
3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(1\
16+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))+1488*\
I*3^(1/2)*ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(\
2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12\
*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))*l\
n(3)+48*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*Pi*ln\
(12)-432*31^(1/2)*arctan(((116+12*3^(1/2)*31^(1/2))^(\
1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))*\
ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*3^(1/2)*31^\
(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/\
2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))-16*I*3^(1/2)*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*ln(29+3*3^(1/2)*31^(1/2)\
)*ln(48)+2480*I*3^(1/2)*ln(2)*ln(-9*I*3^(1/2)*(116+12\
*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2)\
)^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2\
))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)\
+36+12*I*31^(1/2))-96*(116+12*3^(1/2)*31^(1/2))^(1/3)\
*Pi*arctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3^(1/2\
)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))+1488*I*3^(1/2)\
*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(116+12*3^(1/\
2)*31^(1/2))^(1/3)-I*3^(1/2)*(116+12*3^(1/2)*31^(1/2)\
)^(2/3)+4*I*3^(1/2))*ln(48-6*I*(116+12*3^(1/2)*31^(1/\
2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/\
3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3\
)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(116\
+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(116+\
12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1/2)\
)^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1\
/2))+48*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*Pi*ln\
(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31\
^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))\
+2*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(29+3*3^(1/2)*31\
^(1/2))*ln(48-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^\
(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12\
*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31\
^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+\
12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2))-1488*I*a\
rctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3^(1/2)/((1\
16+12*3^(1/2)*31^(1/2))^(1/3)-2))*ln(-9*I*3^(1/2)*(11\
6+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*3^(1/2)*31^(\
```

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1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12*3^(1/2)*31^\
(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(\
1/2)+36+12*I*31^(1/2))+48*I*3^(1/2)*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*ln(9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2\
))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)\
+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)-6*I*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36-12*I*31^(1/2\
))*ln(3)-48*I*arctan(((116+12*3^(1/2)*31^(1/2))^(1/3)\
+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))*(116\
+12*3^(1/2)*31^(1/2))^(1/3)*ln(-9*I*3^(1/2)*(116+12*3\
^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^\
(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))\
^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+3\
6+12*I*31^(1/2))-4*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^\
(4/3)*arctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)\
-4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1\
/2)*31^(1/2))^(2/3)+4))*ln(29+3*3^(1/2)*31^(1/2))+6*I\
*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(48-6*I*(1\
16+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3\
^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^\
(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(\
2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/\
2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116\
+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))\
^(2/3)*3^(1/2)*31^(1/2))*ln(3)-2*I*3^(1/2)*(116+12*3^\
(1/2)*31^(1/2))^(4/3)*ln(29+3*3^(1/2)*31^(1/2))*ln(-9\
*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+1\
2*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+\
12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/\
2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))+6*(116+12*3^(1/2\
)*31^(1/2))^(4/3)*dilog((-(116+12*3^(1/2)*31^(1/2))^(\
2/3)-4+16*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(\
116+12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2))/(-(116+12\
*3^(1/2)*31^(1/2))^(2/3)-4+4*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-4*I\
*3^(1/2)))-744*I*3^(1/2)*ln(-9*I*3^(1/2)*(116+12*3^(1\
/2)*31^(1/2))^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^(2/\
3)*31^(1/2)-18*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1\
/3)+6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36+1\
2*I*31^(1/2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(1\
16+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3\
^(1/2)*31^(1/2))+6*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^\
(4/3)*arctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)\
-4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1\
/2)*31^(1/2))^(2/3)+4))*ln(9*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1\
/2)-18-2*3^(1/2)*31^(1/2))-2480*I*3^(1/2)*ln(2)*ln(9*\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12\
*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2\
)*31^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*31^(1/2)+36-12*I*31^(1/2))-12*(116+12*3^(1/2\
)*31^(1/2))^(4/3)*Pi*arctan(((116+12*3^(1/2)*31^(1/2)\
```

)^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2\
))-24*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(9*\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12\
*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2\
)*31^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*31^(1/2)+36-12*I*31^(1/2))*ln(12)+1440*31^(1\
/2)*Pi*ln(2)+744*I*3^(1/2)*ln(9*I*3^(1/2)*(116+12*3^(\
1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2\
/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(\
1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36-\
12*I*31^(1/2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(\
116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*\
3^(1/2)*31^(1/2))-96*3^(1/2)*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)*Pi*ln(3)-12*3^(1/2)*(116+12*3^(1/2)*31^(1/2))\
^(4/3)*arctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3\
)-4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(\
1/2)*31^(1/2))^(2/3)+4))*ln(3)+720*I*31^(1/2)*ln(-9*I\
3^(1/2)(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*\
3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12\
*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)*31^(1/2)+36+12*I*31^(1/2))*ln(2)-4*3^(1/2)*(1\
16+12*3^(1/2)*31^(1/2))^(4/3)*Pi*ln(29+3*3^(1/2)*31^(\
1/2))+1440*31^(1/2)*arctan(3^(1/2)*((116+12*3^(1/2)*3\
1^(1/2))^(2/3)-4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3\
)+(116+12*3^(1/2)*31^(1/2))^(2/3)+4))*ln(2)+144*3^(1/\
2)*31^(1/2)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(1\
16+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2)*(116+12*3^(1/\
2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48)-1488*3^(1/2)*a\
rctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-1\
6*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^\
(1/2))^(2/3)+4))*ln(12)-1488*ln((116+12*3^(1/2)*31^(1\
/2))^(2/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1\
/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(4\
8-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(\
116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(1\
16+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^\
(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/\
3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3\
)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*3\
1^(1/2))^(2/3)*3^(1/2)*31^(1/2))-432*31^(1/2)*Pi*ln(1\
2)+48*I*arctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3^\
(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))*(116+12*3^\
(1/2)*31^(1/2))^(1/3)*ln(9*I*3^(1/2)*(116+12*3^(1/2)*\
31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*3\
1^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)-\
6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36-12*I*\
31^(1/2))+288*31^(1/2)*Pi*ln(29+3*3^(1/2)*31^(1/2))-9\
6*(116+12*3^(1/2)*31^(1/2))^(1/3)*arctan(3^(1/2)*((11\
6+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-16*(116+12*3^(1/2)*\
31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(2/3)+4))*a\
rctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3^(1/2)/((1\
16+12*3^(1/2)*31^(1/2))^(1/3)-2))-1488*I*3^(1/2)*ln(9\

```
*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+1\
2*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/\
2)*31^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/\
2))^(1/3)*31^(1/2)+36-12*I*31^(1/2))*ln(3)-20*3^(1/2)\
*(116+12*3^(1/2)*31^(1/2))^(4/3)*Pi*ln(2)+48*I*3^(1/2\
)*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(48-6*I*(116+12*3\
^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*\
31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*3\
1^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31\
^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(\
1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(\
1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*\
3^(1/2)*31^(1/2))*ln(3)-12*(116+12*3^(1/2)*31^(1/2))^\
(4/3)*arctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)\
-4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1\
/2)*31^(1/2))^(2/3)+4))*arctan(((116+12*3^(1/2)*31^(1\
/2))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3\
)-2))-6*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(\
-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116\
+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(\
1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))*ln(3)+288*31^(\
1/2)*arctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-\
4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/\
2)*31^(1/2))^(2/3)+4))*ln(29+3*3^(1/2)*31^(1/2))-2*I*\
3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(29+3*3^(1/\
2)*31^(1/2))*ln(48)+496*ln(29+3*3^(1/2)*31^(1/2))*ln(\
48-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*\
(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(\
116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31\
^(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1\
/3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/\
3)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*\
31^(1/2))^(2/3)*3^(1/2)*31^(1/2))+6*I*3^(1/2)*(116+12\
*3^(1/2)*31^(1/2))^(4/3)*ln((116+12*3^(1/2)*31^(1/2))\
^(2/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2)*\
(116+12*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48)-1\
44*I*3^(1/2)*31^(1/2)*arctan(((116+12*3^(1/2)*31^(1/2\
))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-\
2))*ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3\
*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1\
/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/\
2)*31^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))-144*I*3\
1^(1/2)*ln(29+3*3^(1/2)*31^(1/2))*ln(9*I*3^(1/2)*(116\
+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1\
/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1\
/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1\
/2)+36-12*I*31^(1/2))+2*I*3^(1/2)*(116+12*3^(1/2)*31^\
(1/2))^(4/3)*ln(29+3*3^(1/2)*31^(1/2))*ln(9*I*3^(1/2)\
*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*\
31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*\
```

```
31^(1/2)+36-12*I*31^(1/2))-24*I*3^(1/2)*(116+12*3^(1/\
2)*31^(1/2))^(1/3)*ln(9*I*3^(1/2)*(116+12*3^(1/2)*31^\
(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(\
1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)-6*I\
*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36-12*I*31^\
(1/2))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3\
^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*\
31^(1/2))+48*(116+12*3^(1/2)*31^(1/2))^(1/3)*dilog((-\
(116+12*3^(1/2)*31^(1/2))^(2/3)-4+16*(116+12*3^(1/2)*\
31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(\
2/3)-4*I*3^(1/2))/(-(116+12*3^(1/2)*31^(1/2))^(2/3)-4\
+4*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*\
3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2)))+2976*ln(24)*ln(\
3)+4960*3^(1/2)*Pi*ln(2)-8*I*3^(1/2)*(116+12*3^(1/2)*\
31^(1/2))^(1/3)*Pi^2+3*I*3^(1/2)*(116+12*3^(1/2)*31^(\
1/2))^(4/3)*ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))\
^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-1\
8*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+\
12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))\
*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)\
*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/\
2))-432*31^(1/2)*arctan(3^(1/2)*((116+12*3^(1/2)*31^(\
1/2))^(2/3)-4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(\
116+12*3^(1/2)*31^(1/2))^(2/3)+4))*ln(12)-1488*3^(1/2\
)*arctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/\
(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*\
31^(1/2))^(2/3)+4))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1\
/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-\
18-2*3^(1/2)*31^(1/2))+48*I*3^(1/2)*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*dilog(12*(116+12*3^(1/2)*31^(1/2))^(1/\
3)/((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(116+12*3^(1/\
2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2)\
)^(2/3)-4*I*3^(1/2)))+1488*dilog((-(116+12*3^(1/2)*31\
^(1/2))^(2/3)-4+16*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*\
3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2))/\
(-(116+12*3^(1/2)*31^(1/2))^(2/3)-4+4*(116+12*3^(1/2)\
*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^\
(2/3)-4*I*3^(1/2)))-1152*I*31^(1/2)*ln(48-6*I*(116+12\
*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2\
)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)\
*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*\
31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31\
^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3\
^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3\
)*3^(1/2)*31^(1/2))*ln(2)+6*I*(116+12*3^(1/2)*31^(1/2\
))^(4/3)*arctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3\
^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))*ln(9*I*3^\
(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(\
1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31\
^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(\
1/3)*31^(1/2)+36-12*I*31^(1/2))-496*I*3^(1/2)*ln(29+3\
*3^(1/2)*31^(1/2))*ln(48-6*I*(116+12*3^(1/2)*31^(1/2)\
```

```
)^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)\
*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-\
3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(116+1\
2*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(116+12\
*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1/2))^\
(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2\
))-160*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*arctan\
(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-16*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2)\
)^(2/3)+4))*ln(2)+744*I*3^(1/2)*ln(9*I*3^(1/2)*(116+1\
2*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2\
))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3\
)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2\
)+36-12*I*31^(1/2))*ln(12)-744*I*3^(1/2)*ln(-9*I*3^(1\
/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*3^(1/\
2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12*3^(1\
/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2))^(1/\
3)*31^(1/2)+36+12*I*31^(1/2))*ln(12)-2976*Pi*arctan((\
(116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3^(1/2)/((116+12*3\
^(1/2)*31^(1/2))^(1/3)-2))-144*dilog(12*(116+12*3^(1/\
2)*31^(1/2))^(1/3)/((116+12*3^(1/2)*31^(1/2))^(2/3)+4\
-4*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*\
3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2)))*3^(1/2)*31^(1/2\
)+144*I*31^(1/2)*ln(29+3*3^(1/2)*31^(1/2))*ln(-9*I*3^\
(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*3^(\
1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12*3^\
(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2))^(\
1/3)*31^(1/2)+36+12*I*31^(1/2))-216*I*31^(1/2)*ln(-9*\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12\
*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+1\
2*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2\
))^(1/3)*31^(1/2)+36+12*I*31^(1/2))*ln(12)+48*3^(1/2)\
*31^(1/2)*ln(29+3*3^(1/2)*31^(1/2))*ln(48-6*I*(116+12\
*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2\
)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)\
*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*\
31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31\
^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3\
^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3\
)*3^(1/2)*31^(1/2))+48*I*3^(1/2)*(116+12*3^(1/2)*31^(\
1/2))^(1/3)*dilog((-(116+12*3^(1/2)*31^(1/2))^(2/3)-4\
+16*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12\
*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2))/(-(116+12*3^(1/\
2)*31^(1/2))^(2/3)-4+4*(116+12*3^(1/2)*31^(1/2))^(1/3\
)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/\
2)))+864*31^(1/2)*Pi*ln(3)-6*I*(116+12*3^(1/2)*31^(1/\
2))^(4/3)*arctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*\
3^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))*ln(-9*I*\
3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*3\
^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12*\
3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2))\
^(1/3)*31^(1/2)+36+12*I*31^(1/2))-432*31^(1/2)*arctan\
```

```
(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-16*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2)\
)^(2/3)+4))*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116\
+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(\
1/2)*31^(1/2))+48*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))\
^(1/3)*ln((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(116+12\
*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2)*(116+12*3^(1/2)*31\
^(1/2))^(2/3)+4*I*3^(1/2))*ln(48)-144*I*31^(1/2)*ln(2\
9+3*3^(1/2)*31^(1/2))*ln(48-6*I*(116+12*3^(1/2)*31^(1\
/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1\
/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/\
3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(116\
+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1/2\
))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(\
1/2))-432*I*dilog(12*(116+12*3^(1/2)*31^(1/2))^(1/3)/\
((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(116+12*3^(1/2)*\
31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(\
2/3)-4*I*3^(1/2)))*31^(1/2)+1488*I*arctan(((116+12*3^\
(1/2)*31^(1/2))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^\
(1/2))^(1/3)-2))*ln(9*I*3^(1/2)*(116+12*3^(1/2)*31^(1\
/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/\
2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)-6*I*(\
116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36-12*I*31^(1\
/2))-1488*I*3^(1/2)*dilog(12*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)/((116+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(116+12*\
3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^\
(1/2))^(2/3)-4*I*3^(1/2)))+496*I*3^(1/2)*ln(29+3*3^(1\
/2)*31^(1/2))*ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2\
))^(2/3)+3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)\
-18*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2\
))+864*31^(1/2)*arctan(3^(1/2)*((116+12*3^(1/2)*31^(1\
/2))^(2/3)-4)/(-16*(116+12*3^(1/2)*31^(1/2))^(1/3)+(1\
16+12*3^(1/2)*31^(1/2))^(2/3)+4))*ln(3)-6*I*3^(1/2)*(\
116+12*3^(1/2)*31^(1/2))^(4/3)*ln((116+12*3^(1/2)*31^\
(1/2))^(2/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^\
(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln\
(48-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I\
*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*\
(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*3\
1^(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(\
1/3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1\
/3)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)\
*31^(1/2))^(2/3)*3^(1/2)*31^(1/2))-96*3^(1/2)*(116+12\
*3^(1/2)*31^(1/2))^(1/3)*arctan(3^(1/2)*((116+12*3^(1\
/2)*31^(1/2))^(2/3)-4)/(-16*(116+12*3^(1/2)*31^(1/2))\
^(1/3)+(116+12*3^(1/2)*31^(1/2))^(2/3)+4))*ln(3)-3*I*\
3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(9*I*3^(1/2\
)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)\
*31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/\
2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)\
```

```
*31^(1/2)+36-12*I*31^(1/2))*ln(9*(116+12*3^(1/2)*31^(\
1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*3\
1^(1/2)-18-2*3^(1/2)*31^(1/2))+3968*I*3^(1/2)*ln(2)*l\
n(48)-144*3^(1/2)*31^(1/2)*ln((116+12*3^(1/2)*31^(1/2\
))^(2/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2\
)*(116+12*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48-\
6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116\
+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1\
/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)\
*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+\
9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^\
(1/2))^(2/3)*3^(1/2)*31^(1/2))-720*I*31^(1/2)*ln(9*I*\
3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3\
^(1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*\
31^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))\
^(1/3)*31^(1/2)+36-12*I*31^(1/2))*ln(2)-128*I*3^(1/2)\
*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(2)*ln(48)-6*(116+\
12*3^(1/2)*31^(1/2))^(4/3)*ln((116+12*3^(1/2)*31^(1/2\
))^(2/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)-I*3^(1/2\
)*(116+12*3^(1/2)*31^(1/2))^(2/3)+4*I*3^(1/2))*ln(48-\
6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(11\
6+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116\
+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1\
/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)\
*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+\
9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^\
(1/2))^(2/3)*3^(1/2)*31^(1/2))+6*I*3^(1/2)*(116+12*3^\
(1/2)*31^(1/2))^(4/3)*dilog((-(116+12*3^(1/2)*31^(1/2\
))^(2/3)-4+16*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/\
2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2))/(-(11\
6+12*3^(1/2)*31^(1/2))^(2/3)-4+4*(116+12*3^(1/2)*31^(\
1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)\
-4*I*3^(1/2)))-1488*I*3^(1/2)*ln(48-6*I*(116+12*3^(1/\
2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(\
1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1\
/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/\
2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)\
-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)\
*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1\
/2)*31^(1/2))*ln(3)-288*3^(1/2)*31^(1/2)*arctan(3^(1/\
2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-16*(116+12*3\
^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(2/3\
)+4))*arctan(((116+12*3^(1/2)*31^(1/2))^(1/3)+2)*3^(1\
/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2))-3*I*3^(1/2)*\
(116+12*3^(1/2)*31^(1/2))^(4/3)*ln(9*I*3^(1/2)*(116+1\
2*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2\
))^(2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3\
)*3^(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2\
)+36-12*I*31^(1/2))*ln(12)+144*3^(1/2)*31^(1/2)*dilog\
((-(116+12*3^(1/2)*31^(1/2))^(2/3)-4+16*(116+12*3^(1/\
2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*31^(1/2)\
```

```
)^(2/3)-4*I*3^(1/2))/(-(116+12*3^(1/2)*31^(1/2))^(2/3\
)-4+4*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+\
12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2)))-1488*I*3^(1/\
2)*dilog((-(116+12*3^(1/2)*31^(1/2))^(2/3)-4+16*(116+\
12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/2)*(116+12*3^(1/2)*\
31^(1/2))^(2/3)-4*I*3^(1/2))/(-(116+12*3^(1/2)*31^(1/\
2))^(2/3)-4+4*(116+12*3^(1/2)*31^(1/2))^(1/3)+I*3^(1/\
2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2)))-288*\
3^(1/2)*31^(1/2)*Pi*arctan(((116+12*3^(1/2)*31^(1/2))\
^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))^(1/3)-2)\
)-80*I*3^(1/2)*ln(2)*(116+12*3^(1/2)*31^(1/2))^(1/3)*\
ln(-9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(\
116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*\
(116+12*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*3\
1^(1/2))^(1/3)*31^(1/2)+36+12*I*31^(1/2))+496*I*3^(1/\
2)*ln(29+3*3^(1/2)*31^(1/2))*ln(48)+16*I*3^(1/2)*(116\
+12*3^(1/2)*31^(1/2))^(4/3)*ln(48-6*I*(116+12*3^(1/2)\
*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/\
2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2\
))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)\
+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-1\
8*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*3\
1^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2\
)*31^(1/2))*ln(2)+16*(116+12*3^(1/2)*31^(1/2))^(4/3)*\
ln(48-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18\
*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2\
)*(116+12*3^(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)\
*31^(1/2))^(2/3)*31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))\
^(1/3)*3^(1/2)*31^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^\
(1/3)+9*(116+12*3^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/\
2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2))*ln(2)+1152*I*31^\
(1/2)*ln(48)*ln(2)+2*I*3^(1/2)*(116+12*3^(1/2)*31^(1/\
2))^(4/3)*ln(29+3*3^(1/2)*31^(1/2))*ln(48-6*I*(116+12\
*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2\
)*31^(1/2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)\
*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*\
31^(1/2)+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31\
^(1/2)-18*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3\
^(1/2)*31^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3\
)*3^(1/2)*31^(1/2))-432*31^(1/2)*Pi*ln(9*(116+12*3^(1\
/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^(1/2))^(1/3)*3\
^(1/2)*31^(1/2)-18-2*3^(1/2)*31^(1/2))+4960*3^(1/2)*a\
rctan(3^(1/2)*((116+12*3^(1/2)*31^(1/2))^(2/3)-4)/(-1\
6*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+12*3^(1/2)*31^\
(1/2))^(2/3)+4))*ln(2)+3968*ln(48-6*I*(116+12*3^(1/2)\
*31^(1/2))^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/\
2))^(1/3)*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2\
))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)\
+2*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-1\
8*(116+12*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*3\
1^(1/2))^(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2\
)*31^(1/2))*ln(2)+6*3^(1/2)*(116+12*3^(1/2)*31^(1/2))\
```

```
^(4/3)*Pi*ln(9*(116+12*3^(1/2)*31^(1/2))^(1/3)+(116+1\
2*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18-2*3^(1/\
2)*31^(1/2))+48*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln((1\
16+12*3^(1/2)*31^(1/2))^(2/3)+4-4*(116+12*3^(1/2)*31^\
(1/2))^(1/3)-I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3\
)+4*I*3^(1/2))*ln(48)+248*I*3^(1/2)*Pi^2-496*I*3^(1/2\
)*ln(29+3*3^(1/2)*31^(1/2))*ln(9*I*3^(1/2)*(116+12*3^\
(1/2)*31^(1/2))^(2/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(\
2/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^\
(1/2)-6*I*(116+12*3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36\
-12*I*31^(1/2))-1488*3^(1/2)*arctan(((116+12*3^(1/2)*\
31^(1/2))^(1/3)+2)*3^(1/2)/((116+12*3^(1/2)*31^(1/2))\
^(1/3)-2))*ln(5*(116+12*3^(1/2)*31^(1/2))^(2/3)-76-8*\
3^(1/2)*31^(1/2)+7*(116+12*3^(1/2)*31^(1/2))^(1/3)+(1\
16+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2))+216*I\
*31^(1/2)*ln(9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2\
/3)-3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+18*I\
*(116+12*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)-6*I*(116+12*\
3^(1/2)*31^(1/2))^(1/3)*31^(1/2)+36-12*I*31^(1/2))*ln\
(12)+6*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(4/3)*dilo\
g(12*(116+12*3^(1/2)*31^(1/2))^(1/3)/((116+12*3^(1/2)\
*31^(1/2))^(2/3)+4-4*(116+12*3^(1/2)*31^(1/2))^(1/3)+\
I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-4*I*3^(1/2)\
))+4960*ln(24)*ln(2)-3968*ln(48)*ln(2)-1488*ln(48)*ln\
(3)-432*I*31^(1/2)*ln(48-6*I*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)*31^(1/2)+18*I*(116+12*3^(1/2)*31^(1/2))^(1/3)\
*3^(1/2)+9*I*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)-\
3*I*(116+12*3^(1/2)*31^(1/2))^(2/3)*31^(1/2)+2*(116+1\
2*3^(1/2)*31^(1/2))^(1/3)*3^(1/2)*31^(1/2)-18*(116+12\
*3^(1/2)*31^(1/2))^(1/3)+9*(116+12*3^(1/2)*31^(1/2))^\
(2/3)-(116+12*3^(1/2)*31^(1/2))^(2/3)*3^(1/2)*31^(1/2\
))*ln(3)+72*I*31^(1/2)*Pi^2-16*I*3^(1/2)*ln(29+3*3^(1\
/2)*31^(1/2))*(116+12*3^(1/2)*31^(1/2))^(1/3)*ln(-9*I\
*3^(1/2)*(116+12*3^(1/2)*31^(1/2))^(2/3)+3*I*(116+12*\
3^(1/2)*31^(1/2))^(2/3)*31^(1/2)-18*I*3^(1/2)*(116+12\
*3^(1/2)*31^(1/2))^(1/3)+6*I*(116+12*3^(1/2)*31^(1/2)\
)^(1/3)*31^(1/2)+36+12*I*31^(1/2)))/(116+12*3^(1/2)*3\
1^(1/2))^(2/3)
```

-.7597082312-.7552936255e-8*I

Version	Output length
Maple 9.5.1	81336
Maple 9.5	77213
Maple 9	81209
Maple 8	59939
Maple 7	59939

```
        Maple 6        53  (unevaluated)

        Maple V Rel 5   53  (unevaluated)

        Maple V Rel 4   53  (unevaluated)

        Maple V Rel 3   53  (unevaluated)

EXPECTED:       4*polylog(2,RootOf(_Z^3+_Z+1,index=2))*RootOf(1-3*_Z+\
        31*_Z^3,index=2)+4*polylog(2,RootOf(_Z^3+_Z+1,index=3\
        ))*RootOf(1-3*_Z+31*_Z^3,index=3)+4*polylog(2,RootOf(\
        _Z^3+_Z+1,index=1))*RootOf(1-3*_Z+31*_Z^3,index=1)

        -.7597082580+0.*I

CHECKUP:        evalf(Int(ln(z)/(z^(3/2) + z + 1), z= 0..1));

        -.7597082588

COMMENT:        Mathematica 5.0.1 returns a nice short symmetric outp\
        ut.

INTEGRATE ME:   Integrate[Log[z]/(z^(3/2) + z + 1), {z, 0, 1}]

        4(PolyLog[2,1/Root[1+#1^2+#1^3&,1]]/(2+3*Root[1+#1^2+\
        #1^3&,1] )+PolyLog[2,1/Root[1+#1^2+#1^3&,2]]/(2+3*Roo\
        t[1+#1^2+#1^3&,2])+PolyLog[2,1/Root[1+#1^2+#1^3&,3]]/\
        (2+3*Root[1+#1^2+#1^3&,3]))

        -0.759708
```

……...

Example 70. 1-D quadrature.

```
Maple 9.5.1> evalf(Int(z, z= 0..1/10^154));

        0.

Maple V R 4> evalf(Int(z, z= 0..1/10^154));

        .5000000000e-308
```

COMMENT: Derive 6, Mathematica 5 and MuPAD 3 approximate this integral correctly.

```
        APPROX(INT(z, z, 0, 1/10^154))
        NIntegrate[z, {z, 0, 1/10^154}]
        numeric::int(z, z= 0..1/10^154);

        5.00000000000000 10^(-309)
```

```
        5.0e-309
        5.000000000*10^(-309)
```

……...

Example 71. 1-D quadrature.

```
Maple 9.5.1> evalf(Int(exp(z), z= 0..707));

        Float(infinity)   # <--- BUG

Maple V R 4> evalf(Int(exp(z), z= 0..707));

        .1112240502e308
```

……...

Example 72. 1-D quadrature.

```
Maple 9.5.1> evalf(Int(exp(z), z= 0..I*infinity));

        Float(infinity)  # <--- BUG
```

……...

Example 73. 1-D quadrature.

```
Maple 9.5.1> evalf(Int(RootOf(_Z^2-z, index= 1), z= 0..1));

        Error, (in content/gcd) too many levels of recursion
```

EXPECTED: .6666666667

```
Maple 9.5.1> evalf(Int(convert(RootOf(_Z^2-z, index= 1),radical),
        z= 0..1));

        .6666666667
```

HINT: plot(RootOf(_Z^2-z, index= 1), z= 0..1);

```
Maple 8    > evalf(Int(RootOf(_Z^2-z, index= 1), z= 0..1));

        .6666666667
```

……...

Example 74. Extrema identification.

```
Maple 9.5.1> maximize(sin(z)^2, z=0..infinity);

        maximize(sin(z)^2,z = 0 .. infinity)
```

Maple 8 > maximize(sin(z)^2, z=0..infinity);

1

……...

Example 75. Extrema identification.

Maple 9.5.1> maximize(sin(z)+cos(z), z);

maximize(sin(z)+cos(z), z);

Maple V R 5> maximize(sin(z)+cos(z), z);

2^(1/2)

……...

Example 76. Extrema identification. MISSED LOCATION.

DESCRIPTION: Maple reports the empty set for location.

Maple 9.5.1> maximize(1/z, z=0..1, location=true);

infinity, {[{}, infinity]}

EXPECTED: infinity, {[{z=0}, infinity]}

COMPARE: maximize(1/(1+z), z=0..1, location=true);

1, {[{z = 0}, 1]}

……...

NONE.

Example 77. Extrema identification. MEANINGLESS OUTPUT.

DESCRIPTION: An unknown variable f is present in the answer.

Maple 9.5.1> maximize(abs(tan(I+z)), z= 0..1);

f

EXPECTED: (cosh(1)^2-cos(1)^2)^(1/2)/(cos(1)^2+cosh(1)^2-1)^(1/2)

1.117470021

HINT: plot(abs(tan(I+z)), z=0..1);

……...

NONE.

Example 78. Extrema identification. INVALID MAGNITUDE.

DESCRIPTION: Only Maple V, Release 5 of 1997 can maximize this
function correctly.

```
Maple 9.5.1> maximize(sin(z)*arctan(z), z= 0..3);

        sin(3)*arctan(3)

        .1762653495

Maple V R 5> maximize(sin(z)*arctan(z), z= 0..3);

        sin(tan(RootOf(_Z*tan(_Z)^2+_Z+tan(tan(_Z)),1.061575118)\
        ))*arctan(tan(RootOf(_Z*tan(_Z)^2+_Z+tan(tan(_Z)),1.0615\
        75118)))

        1.035933365
```

.....

Example 79. Discontinuities location. SPURIOUS EMPTY SET

DESCRIPTION: Maple 9.03 works well but Maple 9.5.1 is broken.

```
Maple 9.5.1> fdiscont(1/floor(1/z), z= 1/3..1);

        []

Maple 9.03>  fdiscont(1/floor(1/z), z= 1/3..1);

        [.33333333333333 .. .33365767484074,
         .49971309016959 .. .50027514103828]
```

……...

Example 80. Discontinuities location. REGRESSION BUG.

DESCRIPTION: Maple 9.03 works well but Maple 9.5.1 is broken.

```
Maple 9.5.1> discont(1/(1+z^z), z);

        Error, (in discont/duplicates) not implemented yet: 4

Maple 9.03>  discont(1/(1+z^z), z);

        {0, I*Pi/LambertW(-_B1,I*Pi)}

HINT:       plot(apply({Re, Im},1/(1+z^z)), z= -2..2, -1..1);
```

……

Example 81. Asymptotics.

DESCRIPTION: NONE of Maple version can calculate this asymptotics.

Maple 9.5.1> asympt(1/(1+1/2^z), z);

Error, (in asympt) unable to compute series

COMMENT: MuPAD 3 calculates this expansion correctly.

asympt(1/(1+1/2^z), z);

1-1/2^z+1/2^(2*z)-1/2^(3*z)+1/2^(4*z)-1/2^(5*z)+\
O(1/2^(6*z))

……

Example 82. Asymptotics.

(1/4*Pi-I*(2*ln(2)+ln(z)))/z+(1/32*Pi-I*(1/2*ln(2)+1/4*ln(z)-1/4))/z^3+O(1/z^5)

Maple 9.5.1> asympt(EllipticE(z), z);

Mathematica 5
------------ = 38848.2
Maple 9

SR-71 Blackbird reconnaissance plane
---------- = 40000
Three-toed sloth

http://homepages.westminster.org.uk/hooke/issue11/warfare.html
http://www.guinnessworldrecords.com/

……

Example 83. Asymptotics.

Maple 9.5.1> asympt(exp(-1) - (1+z)^z/(2+z)^z, z, 1);

Error, (in limit/eval) too many levels of recursion

= O(1/z)

CHECKUP: f:=convert(asympt(exp(-1)-(1+z)^z/(2+z)^z,z,3),polynom);

evalf(subs(z= 100000, exp(-1) - (1+z)^z/(2+z)^z));
evalf(subs(z= 100000, f));

-0.55181e-5
-0.5518191618e-5

COMMENT: Mathematica 5 calculates this expansion correctly.

Series[1/E - (1 + z)^z/(2 + z)^z, {z, Infinity, 1}]

- 3/(2*E*z) + O[1/z^6]

……...

Example 84. pade: SIDE EFFECT.

DESCRIPTION: Being asked repeatedly, Maple returns, at random, TWO di\
stinct answers (A), and (B), of the following pattern, f\
or the same input. Maple 6 of 2000 and the earlier versi\
ons behave themselves stable.

(output A)

Error message
Expression
Error message

(output B)

Error message
Expression
Expression

Maple 9.5.1> restart;
with(numapprox):
pade(1/abs(-1+I*ln(1-z^3)^(1/3)), z, [2, 2]);
pade(1/abs(-1+I*ln(1-z^3)^(1/3)), z, [3, 3]);
pade(1/abs(-1+I*ln(1-z^3)^(1/3)), z, [2, 2]);

ACTUAL: (output A)

Error, (in convert/ratpoly) series order too small for s\
pecified degrees
(I-1/6*I*z^3)/(I+(-1)^(1/3)*z-1/6*I*z^3)
Error, (in convert/ratpoly) series order too small for s\
pecified degrees

(output B)

Error, (in convert/ratpoly) series order too small for s\
pecified degrees
(-I+1/6*I*z^3)/(-I+(-37*(-1)^(1/3)-36*I*(-1)^(5/6))*z+(-\
36*(-1)^(1/6)-36*I*(-1)^(2/3))*z^2+1/6*I*z^3)
-1/6*(-1)^(2/3)*z/(-1/6*(-1)^(2/3)*z-1/6*I*z^2)

EXPECTED: Maple always returns the pattern (B).

```
Maple 6   > restart;                    # always the same output
          with(numapprox):
          pade(1/abs(-1+I*ln(1-z^3)^(1/3)), z, [2, 2]);
          pade(1/abs(-1+I*ln(1-z^3)^(1/3)), z, [3, 3]);
          pade(1/abs(-1+I*ln(1-z^3)^(1/3)), z, [2, 2]);

          Error, (in convert/ratpoly) series order too small for s\
          pecified degrees

          (-I+1/6*I*z^3)/(-I-(-1)^(1/3)*z+1/6*I*z^3)
          -1/6*(-1)^(2/3)*z/(-1/6*(-1)^(2/3)*z-1/6*I*z^2)
```

……...

NONE.

Example 85. 1-D quadrature. SPURIOUS CONVERGENCE

DESCRIPTION: Maplesoft returns a small number which can make the user having impression that the integral converges.

```
Maple 9.5.1> evalf(Int(ceil(sin(z)), z=0..infinity));

          64.40264940    # <--- BUG

          Float(infinity)
```

HINT: plot(Int(ceil(sin(z)), z= 0..a), a= 0..10);

……...

Example 86. 1-D quadrature. INVALID MAGNITUDE

```
Maple 9.5.1> evalf(Int(1/(z^(8/9)*(1+z^(1/10))), z= 0..1));
          evalf(Int(1/(z^(8/9)*(1+z^(1/90))), z= 0..1));

          -3645.959981   # <--- BUG
          990233458.1    # <--- BUG

Maple 8   > evalf(Int(1/(z^(8/9)*(1+z^(1/10))), z= 0..1));
          evalf(Int(1/(z^(8/9)*(1+z^(1/90))), z= 0..1));

          6.117261826
          4.723896607
```

……...

Example 87. 1-D quadrature. SPURIOUS ERROR MESSAGE

```
Maple 9.5.1> evalf(Int(ln(1/Zeta(z)), z= 1..infinity));
```

Error, (in evalf/int) invalid subscript selector

Maple 6> evalf(Int(ln(1/Zeta(z)), z= 1..infinity));

-1.797569959

……...

Example 88. 1-D quadrature. SPURIOUS DIVERGENCE

DESCRIPTION: Only Maple 6 and earlier versions can approximate this integral correctly using the default quadrature method.

Maple 9.5.1> evalf(Int(exp(-z)*ln(sinh(2*z)), z= 0..infinity));

Float(infinity)

Maple 6 > evalf(Int(exp(-z)*ln(sinh(2*z)), z= 0..infinity));

.9570906879

……...

Example 89. 2-D quadrature. SPURIOUS ERROR MESSAGE

Maple 9.5.1> evalf(Int(Int(x+I, x= 0..1), y= 0..1));

Error, (in evalf/int) Unable to handle definite integral

Maple V R 5> evalf(Int(Int(x+I, x= 0..1), y= 0..1));

.5000000000+1.000000000*I

……...

Example 90. 2-D quadrature. SLOWDOWN OF 2044 TIMES.

Maple 9.5.1> restart; time(evalf(Int(Int(sqrt(x-y), x= 0..1), y= 0..1)));

947.3

941.371, 961.249, 986.117, 904.320, 890.951, 909.287, 1006.438
1028.007, 917.328, 928.094

Maple 8 > restart; time(evalf(Int(Int(sqrt(x-y), x= 0..1), y= 0..1)));

0.418

.420, .451, .420, .431, .400, .400, .431, .400, .431, .399

……...

NONE

Example 91. Approximation.

Maple 9.5.1> evalf(Sum(cos(2/3*Pi*n)/(2^n), n= 1..infinity));

Sum(cos(2/3*Pi*n)/2^n, n = (1 .. infinity))

-.2857142857 # = -2/7

COMMENT: Derive 6, Mathematica 5 and MuPAD 3 approximate this sum correctly.

APPROX(SUM(COS(2/3*pi*n)/2^n, n, 1, inf))
NSum[Cos[2/3 Pi n]/2^n, {n, 1, Infinity}]
numeric::sum(cos(2/3*PI*n)/(2^n), n= 1..infinity);

-0.2857142857
-0.285714
-0.2857142857

……...

Example 92. 2-D integration.

Maple 9.5.1> int(int(arctan(x/y-1), x= 1..infinity), y= 1..infinity);

-signum(FAIL[1])*infinity

Maple 7 > int(int(arctan(x/y-1), x= 1..infinity), y= 1..infinity);

Float(infinity)

……...

Example 93. 2-D integration.

Maple 9.5.1> int(int(1/(x*y*(x^3+y^3)), x=1..infinity), y=1..infinity);

undefined

= 2/9*ln(2) = .1540327068

Maple 8 > int(int(1/(x*y*(x^3+y^3)), x=1..infinity), y=1..infinity);

2/9*ln(2)

……...

Example 94. 2-D integration. INVALID MAGNITUDE.

DESCRIPTION: Only Maple V, Release 5 of 1997, Maple V, Release 4 of 1995, and Maple V, Release 3 of 1994 can calculate this integral correctly.

```
Maple 9.5.1> int(int(Heaviside(x^2-y^2), x= 0..1), y= 0..1);

        3/2

Maple V R 4> int(int(Heaviside(x^2-y^2), x= 0..1), y= 0..1);

        1/2
```

……...

Example 96. 2-D integration.

```
Maple 9.5.1> int(int(abs(x)/(1+x^2+y^2)^2, x=-infinity..infinity), y=\
        -infinity..infinity);

        undefined   # <- BUG. Correct answer = Pi

Maple 8    > int(int(abs(x)/(1+x^2+y^2)^2, x=-infinity..infinity), y=\
        -infinity..infinity);

        Pi
```

……...

Example 97. 3-D integration.

```
Maple 9.5.1> int(int(int(1/(x+y+z), x= 1..2), y = 1..2), z = 1..2);

        undefined

Maple 8   > int(int(int(1/(x+y+z), x= 1..2), y = 1..2), z = 1..2);

        66*ln(2)+27/2*ln(3)-75/2*ln(5)

        .225058097697107207844655718711714023514080613314 54

CHECKUP:    evalf(Int(Int(Int(1/(x+y+z),x=1..2), y=1..2),z=1..2),50);

        .225058097697107207844655718711714023514080613314 55
```

COMMENT: Derive 6, Mathematica 5 and MuPAD 3 calculate this integral correctly.

```
        INT(INT(INT(1/(x + y + z), x, 1, 2), y, 1, 2), z, 1, 2)
        Integrate[1/(x + y + z), {x, 1, 2}, {y, 1, 2}, {z, 1, 2}]
        int(int(int(1/(x+y+z), x= 1..2), y = 1..2), z = 1..2);
```

```
- 75*LN(5)/2 + 27*LN(3)/2 + 66*LN(2)
(3/2)*(44*Log[2] + 9*Log[3] - 25*Log[5])
24*ln(4) - 9/2*ln(3) - 75/2*ln(5) + 18*ln(6)

0.2250580977
0.225058
0.2250580977
```

……...

Example 98. 3-D integration.

```
Maple 9.5.1> int(int(int(exp(-x-y-z)/(1+x+y+z),
        x = 0..infinity), y = 0..infinity), z = 0..infinity);

        undefined

        # = 1/2*exp(1)*Ei(1,1) = .2981736811

Maple 8    > int(int(int(exp(-x-y-z)/(1+x+y+z),
        x = 0..infinity), y = 0..infinity), z = 0..infinity);

        1/2*Ei(1,1)*exp(1)
```

……...

Example 99. 3-D integration. SPURIOUS undefined.

```
Maple 9.5.1> int(int(int(1/(x*y*z + x + y + z)^2, x= 1..infinity), y=\
        1..infinity), z= 1..infinity);

        undefined

Maple 8    > int(int(int(1/(x*y*z + x + y + z)^2, x= 1..infinity), y=\
        1..infinity), z= 1..infinity);

        1/24*Pi^2

        .4112335169

CHECKUP:     evalf(Int(Int(Int(1/(x*y*z + x + y + z)^2, x= 1..infinit\
        y), y=1..infinity), z= 1..infinity));

        .4112335167
```

……...

NONE!

Example 100. 1-D limit.

Maple 9.5.1> limit(sin(z)^2+cos(z)^2, z=infinity);

0 .. 2

Historic remark. Scipion Del

cos^2 z + sin^2 z= 1

……...

NONE!

Example 101. 1-D limit.

Maple 9.5.1> limit(arctan(tan(z)), z= infinity);

Error, (in limit/range) should not happen 33

EXPECTED: -Pi/2..Pi/2

HINT: plot(arctan(tan(z)), z= 1000..1020);

COMMENT: Mathematica 5 calculates this limit correctly.

Limit[ArcTan[Tan[z]], z -> Infinity]

Interval[{-Pi/2, Pi/2}]

……...

Example 102. 1-D limit.

DESCRIPTION: The answer involves meaningless symbols FAIL[1] .

Maple 9.5.1> limit(arctan(a*z+1)*z+1, z= infinity);

signum(FAIL[1])*infinity

EXPECTED: csgn(a)*infinity-Im(1/a)*I

CHECKUP: limit(arctan((2*I+5)*z+1)*z+1, z= 10^10.);
evalf(subs(a = 2*I+5, csgn(a)*infinity-Im(1/a)*I));

.1570796327e11+.6896551724e-1*I

Float(infinity)+.6896551724e-1*I

……...

Example 103. 1-D limit.

DESCRIPTION: Only Maple 6 and the earlier versions can calculate this

limit correctly.

Maple 9.5.1> limit(sqrt(1-ln(1+1/z^2)), z= 1, left);

ACTUAL: -(1-ln(2))^(1/2)

-.5539429749

EXPECTED: (1-ln(2))^(1/2)

.5539429749

CHECKUP: evalf(Limit(sqrt(1-ln(1+1/z^2)), z=1-1/10^100));

.5539429749

Maple 6 > limit(sqrt(1-ln(1+1/z^2)), z= 1, left);

(1-ln(2))^(1/2)

.5539429749

……...

Example 104. 1-D limit.

DESCRIPTION: Only Maple V, Release 5 of 1997 and the earlier versions can calculate this limit correctly.

Maple 9.5.1> limit(1/(z-1)^(1/3), z= 1);

limit(1/(z-1)^(1/3), z = 1)

Maple V R 5> limit(1/(z-1)^(1/3), z= 1);

undefined

……...

NONE!

Example 105. 1-D limit.

Maple 9.5.1> limit((z/2^z+1/z)/(cos(z)/2^z+1/z), z= infinity);

undefined

EXPECTED: 1

HINT: plot((z/2^z+1/z)/(cos(z)/2^z+1/z), z= 0..100);

COMMENT: Mathematica 5 calculates this limit correctly.

```
Limit[(z/2^z+1/z)/(Cos[z]/2^z+1/z), z -> Infinity]

1
```

……...

Example 106. 1-D limit. INVALID RANGE.

```
Maple 9.5.1> limit(tan(I+z)*tanh(z), z= infinity);

        -1/(cosh(1)^2-1)+I*sinh(1)/cosh(1) .. 1/(cosh(1)^2-1)+I*\
        sinh(1)*cosh(1)/(cosh(1)^2-1)

        -.7240616607+.7615941561*I .. .7240616607+1.313035286*I

EXPECTED:    tan(1/2*RootOf(2*sin(_Z)*exp(_Z-2*I)+exp(_Z-2*I)^2-1))*t\
        anh(I-1/2*RootOf(2*sin(_Z)*exp(_Z-2*I)+exp(_Z-2*I)^2-1))\
        +I*sinh(1)/cosh(1) .. -tan(1/2*RootOf(2*sin(_Z)*exp(_Z-2\
        *I)+exp(_Z-2*I)^2-1))*tanh(I-1/2*RootOf(2*sin(_Z)*exp(_Z\
        -2*I)+exp(_Z-2*I)^2-1))+I*sinh(1)*cosh(1)/(cosh(1)^2-1)

        -.2601121559+.7615941562*I .. .2601121559+1.313035285*I

HINT:          plot(Re(tan(I+z)*tanh(z)), z= 10..20);
             plot(Im(tan(I+z)*tanh(z)), z= 10..20);
```

……...

Example 107. 1-D limit. SIMPLE LIMIT CANNOT BE CALCULATED.

DESCRIPTION: Only Maple V, Release 4 of 1995 and Maple V, Release 3 of 1994 can calculates this limit correctly.

```
Maple 9.5.1> limit(hypergeom([n],[n],n), n= 1);

        limit(hypergeom([],[],n),n = 1)
```

EXPECTED: exp(1)

```
Maple V R 4> limit(hypergeom([n],[n],n), n= 1);

        exp(1)
```

……...

Example 108. 1-D summation. INVALID EXCEPTION.

DESCRIPTION: NONE of Maple version can calculate this sum correctly.

```
Maple 9.5.1> sum(1/n, n= -infinity..-2);
```

```
        Error, (in cot) numeric exception: division by zero

        -infinity

WORKAROUND:  limit(sum(1/n, n= -a..-2), a= infinity);

        -infinity

HINT:       asympt(sum(1/n, n= -a..-2), a, 1);

        -ln(a)-gamma+1+O(1/a)

COMMENT:    Derive 6 and MuPAD 3 calculate this sum correctly.

        SUM(1/n, n, -inf, -2)
        sum(1/n, n= -infinity..-2);

        -inf
        -infinity
```

……...

Example 109. 1-D summation. INVALID EXCEPTION.

```
Maple 9.5.1> sum(sum(n/m!, m= 0..n), n= 0..1);

        Error, (in NumericRange) summand is singular in the \
        interval of summation

        # = 2

Maple 9.03>  sum(sum(n/m!, m= 0..n), n= 0..1);

        2*exp(1)*exp(-1)
```

……...

Example 110. 1-D summation. INVALID FORMULA.

```
Maple 9.5.1> sum(1+m!, m=0..n);

        hypergeom([1, 1],[],1)-(n+1)!*hypergeom([1, 2+n],[],1)

        evalf(subs(n=1, sum(1+m!, m=0..n)));

        2.000000000+0.*I   # <--- INVALID VALUE

EXPECTED:    n+1+hypergeom([1, 1],[],1)-(n+1)!*hypergeom([1, 2+n],[],1)

CHECKUP:     evalf(subs(n=1,n+1+hypergeom([1, 1],[],1)-(n+1)!*hypergeom([1,\
        2+n],[],1)));
```

```
        sum(1+m!, m=0..1);

Maple 9.03>  sum(1+m!, m=0..n);

        n+1+hypergeom([1, 1],[],1)-(n+1)!*hypergeom([1, 2+n],[],1)

        # All OK.
```

……...

Example 111. 1-D summation.

DESCRIPTION: Maple successfully divides by zero.

```
Maple 9.5.1> sum(GAMMA(k+1/2)/GAMMA(k)/k!, k= 0..infinity);

        1/2*Pi^(1/2)*(exp(1/2)*BesselI(0,1/2)+exp(1/2)*BesselI(1\
        ,1/2))

Maple 9.03 > sum(GAMMA(k+1/2)/GAMMA(k)/k!, k= 0..infinity);

        Error, (in sum/infinite) summand is singular at k = 0 in
        the interval of summation

CHECKUP:     sum(GAMMA(k+1/2)/GAMMA(k)/k!, k= 0..1);
        sum(GAMMA(k+1/2)/GAMMA(k)/k!, k= 0..10);

        Error, (in GAMMA) numeric exception: division by zero
        Error, (in GAMMA) numeric exception: division by zero

HINT:       GAMMA(0+1/2)/GAMMA(0)/0!;

        Error, (in GAMMA) numeric exception: division by zero
```

……...

Example 112. 1-D summation. SPURIOUS INDETERMINATE FORM

```
Maple 9.5.1> sum(1/(n*(n^4+1)), n= 1..infinity);

        -infinity*signum(-1+1/4*Sum(1,_alpha = RootOf(_Z^4+1)))+\
        gamma-Sum(-1/4*Psi(1-_alpha),_alpha = RootOf(_Z^4+1))

        Float(undefined)-0.*I

Maple V R 4> sum(1/(n*(n^4+1)), n= 1..infinity);

        gamma-Sum(-1/4*Psi(1-_alpha),_alpha = RootOf(_Z^4+1))

        .5350348873
```

……...

Example 113. 1-D summation. MEANINGLESS OUTPUT.

DESCRIPTION: The answer involves meaningless symbols FAIL[1] .

Maple 9.5.1> sum(signum((-1)^n), n= 0..infinity);

-1/2*signum(FAIL[1])+1/2

EXPECTED: undefined

CHECKUP: seq(sum(signum((-1)^n), n= 0..k), k= 1..19);

0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0

Maple 9.03 > sum(signum((-1)^n), n= 0..infinity);

undefined

……...

Example 114. 1-D summation. TIME CONSUMING SUMMATION.

DESCRIPTION: Trivial summation is strikingly time consuming. Maple's
competitors calculate it about 1000-100000 times faster.
It takes Derive 6 about 0.001 second to get the answer.
It takes MuPAD 3 about 0.1 second to get the answer.

Maple 9.5.1> time(sum(abs(n), n= 0..10^7));
Maple 9 > time(sum(abs(n), n= 0..10^7));
Maple 8 > time(sum(abs(n), n= 0..10^7));
Maple 7 > time(sum(abs(n), n= 0..10^7));
Maple 6 > time(sum(abs(n), n= 0..10^7));

81.718 seconds

70.071 seconds

2034.906 seconds

458.729 seconds

433.594 seconds

EXPECTED: Maple returns the answer within 1/10..1/1000 second.

……...

Example 115. 1-D summation. SLOWDOWN OF 1000 TIMES.

Maple 9.5.1> time(sum((-1)^n*(n-1000)/(1+n+n^2), n= 2..infinity));

```
time(sum((-1)^n*(n-100)/(1+n+n^2), n= 2..infinity));
time(sum((-1)^n*(n-99)/(1+n+n^2), n= 2..infinity));

?
12608.471  # seconds
10983.503  # seconds

Maple 8    > time(sum((-1)^n*(n-100)/(1+n^2+n+n^3), n= 2..infinity));
time(sum((-1)^n*(n-99)/(1+n^2+n+n^3), n= 2..infinity));

12.258     # seconds
12.258     # seconds
```

……...

Example 116. 1-D summation. INVALID FEED.

DESCRIPTION: Because of an invalid feed, function eval is present at the user's level.

```
Maple 9.5.1> sum(LerchPhi(n,-1,2)/n, n= 2..k);

-4*LerchPhi(3,-1,2)*(2*k-1)/((k+1)^2-2*k-1)+eval(sum(-4*\
LerchPhi(3,-1,2)/n^2,n),{n = k+1})+4*LerchPhi(3,-1,2)-ev\
al(sum(-4*LerchPhi(3,-1,2)/n^2,n),{n = 2})

Maple 9.03 > sum(LerchPhi(n,-1,2)/n, n= 2..k);

2/k-Psi(1,k)-2+1/6*Pi^2
```

……...

Example 117. 1-D summation. INVALID FEED.

DESCRIPTION: Because of an invalid feed, sum(0,n = 2 .. k) is present at the user's level.

```
Maple 9.5.1> sum(LerchPhi(n,-1,2), n= 2..k);

1/k-Psi(1,k)+1/6*Pi^2-Psi(k+1)-gamma+sum(0,n = 2 .. k)

Maple 9.03>  sum(LerchPhi(n,-1,2), n= 2..k);

-Psi(1,k)-Psi(k)+1/6*Pi^2-gamma
```

……...

Example 118. 1-D product calculation.

```
Maple 9.5.1> product(1+1/(0.33*n^2+5*n), n= 1..infinity);

Float(infinity)
```

= 1.901119896

……...

NONE!

Example 119. 1-D product calculation.

```
Maple 9.5.1> product(i/(n-i), i= 1..n-1);

        0
```

EXPECTED: 1

```
CHECKUP:    product(i/(2-i), i= 1..2-1);
        product(i/(3-i), i= 1..3-1);
        product(i/(4-i), i= 1..4-1);
        product(i/(5-i), i= 1..5-1);

        1
        1
        1
        1
```

COMMENT: Mathematica 5 calculates this product correctly.

```
HINT:       plot(Product(i/(n-i), i= 1..n-1), n= 0..10);

        Product[i/(n - i), {i, 1, n - 1}]

        1
```

……...

Example 120. Simplification.

```
Maple 9.5.1> simplify(((1/30)^I)^(1/I));

        1/30

        # = exp(2*Pi)/30  =  17.84972186

Maple 9.03 > simplify(((1/30)^I)^(1/I));

        (30^(-I))^(-I)  # Okay


Maple 9.5.1> assume(z>0);
        simplify((z^I)^(1/I));
```

```
        z

Maple 9.03 > assume(z>0);
        simplify((z^I)^(1/I));

        (z^I)^(-I)

COMMENT:    fnormal(evalf(subs(z=1/1000,(z^I)^(1/I))));
        fnormal(evalf(subs(z=1/100,(z^I)^(1/I))));
        fnormal(evalf(subs(z=1/40,(z^I)^(1/I))));
        fnormal(evalf(subs(z=1/30,(z^I)^(1/I))));
        fnormal(evalf(subs(z=1/25,(z^I)^(1/I))));

        .5354916555+0.*I
        5.354916555+0.*I
        13.38729139+0.*I
        17.84972185+0.*I
        21.41966622-0.*I
```

……...

Example 121. Simplification.

DESCRIPTION: Only Maple V Release 5 of 1997 calculates the comparison correctly.

```
Maple 9.5.1> simplify(abs((-1)^z), assume=positive);

        abs((-1)^z)

Maple V R 5> simplify(abs((-1)^z), assume=positive);

        1
```

……...

Example 122. Simplification.

```
Maple 9.5.1> simplify(diff(sqrt((sqrt(1/z)*z-sqrt(z))*(sqrt(1/z)*z+\
        sqrt(z))), z));

        Error, (in simplify/recurse) numeric exception: division
        by zero

        # = 0

Maple 6.01 > simplify(diff(sqrt((sqrt(1/z)*z-sqrt(z))*(sqrt(1/z)*z+\
        sqrt(z))), z));

        0
```

……...

Example 123. Simplification.

Maple 9, 9.5, 9.5.1

```
> assume(x<1, y<1):
  f := sqrt((1-x)/(1-y))/(1-x)/(1-y);
  simplify(f-simplify(f));

2/(1-x)^(1/2)/(1-y)^(3/2)
```

Must be = 0

……...

Example 124. Simplification.

```
Maple 9.5.1> simplify(7*Pi-16*arctan(1/(sqrt(2)-1)));

        -16*arctan(1/(2^(1/2)-1))+7*Pi

        # = Pi

        # Derive 6 and MuPAD 3 simplify this expression correctly.
```

……...

Example 125. Simplification.

DESCRIPTION: None of Maple versions over 22 years of development can simplify this.

According to Maplesoft, Maple is designed, in particular, for teaching math students. Thus, inability to use a trivial trigonometric formula must be construed as a critical bug. Maple's competitors simplify this input instantly.

```
Maple 9.5.1> simplify(3*sin(z)+4*cos(z)-5*(sin(z+arcsin(4/5))));

        3*sin(z)+4*cos(z)-5*sin(z+arcsin(4/5))
```

EXPECTED: 0

COMMENT: Derive 6 and Mathematica 5 simplify this expression correctly.

```
        3*SIN(z) + 4*COS(z) - 5*SIN(z + ASIN(4/5))
        Simplify[3 Sin[z] + 4 Cos[z] - 5 Sin[z + ArcSin[4/5]]]

        0
        0
```

……...

Example 126. Simplification.

DESCRIPTION: Only Maple V, Release 3 of 1994 can simplify this sum
correctly.

A spurious error message is raised at simplification.
Actually, the summand is not singular at n = 0, its
value is equal to 1.

```
Maple 9.5.1> simplify(sum(hypergeom([-1/2,n],[1+n],-1)/((1+n)*n!), n=\
0..infinity));

Error, (in hypergeom/check_parameters) function doesn't \
exist: found the number 0 in the second list of parameters
```

EXPECTED: sum(hypergeom([-1/2,n],[1+n],-1)/((1+n)*n!),n=0..infinity)

```
HINT:       evalf(subs(n=0, hypergeom([-1/2,n],[1+n],-1)/((1+n)*n!)));

        1.000000000
```

……...

+++++VVB
NONE!
Example 127. Simplification.

DESCRIPTION: Being loaded, RealDomain package kills simplification.

```
Maple 9.5.1> with(RealDomain):
        assume(z>0, a>0);
        simplify((z^a)^(1/a));

        (z^a)^(1/a)
```

EXPECTED: z

```
CHECKUP:    restart;
        assume(z>0, a>0);
        simplify((z^a)^(1/a));

        z
```

……...

NONE!

Example 128. Simplification.

```
Maple 9.5.1> simplify(hypergeom([1],[],1));

                hypergeom([1],[],1)

HINT:          plot(hypergeom([1],[],z), z= 0.9..1.1);
```

……...

Example 129. Singularities location.

DESCRIPTION: Only Maple 6 of 2000 finds the singularities correctly.

```
Maple 9.5.1> singular(signum(tan(z)), z);

        Error, (in limit/range) should not happen 33

Maple 6    > singular(signum(tan(z)), z);

        {z = _Z1*Pi+1/2*Pi}
```

……...

Example 130. Equivalence testing. INVALID false.

```
Maple 9.5.1> is(sin(z) = convert(sin(z), GAMMA));
        evalb(sin(z) = convert(sin(z), GAMMA));
        verify(sin(z), convert(sin(z), GAMMA));

        false
        false
        false

Maple 7    > is(sin(z) = convert(sin(z), GAMMA));
        evalb(sin(z) = convert(sin(z), GAMMA));
        verify(sin(z), convert(sin(z), GAMMA));

        true
        true
        true
```

……...

Example 131. Equivalence testing. TRIVIAL COMPARISON FAILS.

DESCRIPTION: This comparison is too simple to be left returning FAIL
but only Maple V, Release 5 of 1997 calculates it
correctly.

```
Maple 9.5.1> is(abs((-1)^sqrt(2)) = 1);

        FAIL
```

```
Maple V R 5> is(abs((-1)^sqrt(2)) = 1);

        true
```

COMMENT: Derive 6.1, Mathematica 5.0.1 and MuPAD 3 calculate this example correctly.

```
        IDENTICAL?(ABS((-1)^SQRT(2)), 1)
        TrueQ[Abs[(-1)^Sqrt[2]] == 1]
        is(abs((-1)^sqrt(2)) = 1);

        true
        True
        TRUE
```

……...

Example 132. Residue. SPURIOUS ERROR MESSAGE.

DESCRIPTION: Only Maple V, Release 3 of 1994 can calculate this residue correctly.

```
Maple 9.5.1>    residue(erfi(sqrt(z)), z= -1);

                Error, (in series/erfi) too many levels of recursion

Maple V R 3>    residue(erfi(sqrt(z)), z= -1);

                0
```

……...

Example 133. Residue. DUPLICATE

```
Maple 9.5.1>    residue(z/(1+z^5), z= cos(Pi/5)+I*sin(Pi/5));

                0

                # = -1/5*(-1)^(2/5)
```

COMMENT: http://www.math.ubc.ca/people/faculty/israel/advisor/

Maple Advisor Database by Robert Israel

Example 134. dsolve.

111111111111111111111111111111111

Example 135. dsolve.

Maple 9.5.1>

```
dsolve({diff(y(z),z,z)+y(z)^2=0, y(0)=0, y(Pi)=0},y(z));
```

0

Maple 6 - LOOPED
Other return - NULL

DSolve[{y''[z] + y[z]^2 == 0, y[0] == 0, y[Pi] == 0}, y[z], z]

{{y[z] -> 0}}

.....

NONE.

Example 136. dsolve.

.....

BUG # XXXXX dsolve: TOO COMPLICATED SOLUTION

!!!
!!! NONE of Maple version can solve this ODE correctly !!!
!!!

REGRESSION NO

REPRODUCIBLE ALWAYS

BUG HISTORY: PRESENT Maple 9.51, IBM INTEL NT, Aug 9 2004 Build ID 163356
PRESENT Maple 9.50, IBM INTEL NT, Apr 7 2004 Build ID 155251
BUG-1 Maple 9.03, IBM INTEL NT, Oct 1 2003 Build ID 141050
BUG-1 Maple 9.01, IBM INTEL NT, Jul 9 2003 Build ID 137227
BUG-1 Maple 8.00, IBM INTEL NT, May 10 2002 Build ID 111221
BUG-1 Maple 7.00, IBM INTEL NT, May 28 2001 Build ID 96223
BUG-1 Maple 6.01, IBM INTEL NT, Jun 9 2000 Build ID 79514
BUG-2 Maple V, Release 5, IBM INTEL NT, Nov 27 1997
ERROR-1 Maple V, Release 4, IBM INTEL NT, Dec 15, 1995
ERROR-2 Maple V, Release 3, IBM INTEL NT, Jan 10, 1994

DESCRIPTION: Maple returns an analyst's nighmare instead of trivial z.
Gents, get simpler, and the users will turn to you!

EXPRESSION: dsolve({diff(y(z),z) = sqrt((y(z)^2+1)/(z^2+1)), y(0)=0},y(z));

ACTUAL: y(z) = RootOf(((_Z^2+1)/(z^2+1))^(1/2)*(z^2+1)^(1/2)*arcsinh(z)-arcsinh(_Z)*\
(_Z^2+1)^(1/2))

EXPECTED: y(z) = z

COMMENT: Mathematica 5 and MuPAD 3 solve this ODE correctly.

SOLVE ME: DSolve[{y'[z] == Sqrt[(y[z]^2+1)/(z^2+1)], y[0] == 0}, y[z], z]

```
                    solve(ode({y'(z)=sqrt((y(z)^2+1)/(z^2+1)), y(0)=0}, y(z)));

                    {{y[z] -> z}}
                    {z}
```

COMMENT: Actually,

```
                    _C1-1/(y(z)^2+1)^(1/2)*((y(z)^2+1)/(z^2+1))^(1/2)*(z^2+1)^(1/2)*arcsinh(z)+\
                    arcsinh(y(z))
```

is equal to z but it is not esay to see this fact. A hint is

```
                    expr := _C1-1/(y(z)^2+1)^(1/2)*((y(z)^2+1)/(z^2+1))^(1/2)*(z^2+1)^(1/2)
                    *arcsinh(z)\ +arcsinh(y(z)):

                    evalf(subs({_C1= 1/2, y(z)= 1/2,   z= 1/2}, expr));
                    evalf(subs({_C1= 1,   y(z)= 1/2,   z= 1/2}, expr));
                    evalf(subs({_C1= 2,   y(z)= 1/2,   z= 1/2}, expr));
                    evalf(subs({_C1= 3,   y(z)= 1/2,   z= 1/2}, expr));
                    evalf(subs({_C1= -12, y(z)= 1/22, z=1/22}, expr));

                    .5000000000
                    1.
                    2.
                    3.
                    -12.
```

COMMENT: BUG-1 = Maple returns NULL .

BUG-2 = Maple returns an answer seemingly involving an indeterminate parameter

```
                    _C1-1/(y(z)^2+1)^(1/2)*((y(z)^2+1)/(z^2+1))^(1/2)*(z^2+1)^(1/2)*arcsinh(z)+\
                    arcsinh(y(z)) = 0
```

but in fact it is an identity 0 = 0; thus, this is a Maple bug.

ERROR-1 = Error, (in int) argument is not an algebraic

ERROR-2 = Error, (in solve/sumint) cannot solve for variables used in unevaluated sum/ints

……...

Example 137. Simplification.

Maple 9.5.1>

……...

Example 34. Simplification.

Maple 9.5.1>

……...

b) freshman & sophomore rank flaws

c) sophisticated flaws

---> OUR RESULTS

SIDE EFFECTS - none of Maple experts pointed out clearly
(at least publicly)
2) even there was a arguments (there is a bug/there is no bug)

What we see depends on our model (Einstein)

---> EXAMPLES OF *BAD* REGRESSIONS
---> EXAMPLES OF REGRESSIONS
---> VVB CONTRIBUTION
---> GUI vs command line, Or Maple experts are not perfect

……...

Example 137. Translation from Mathematica.

```
Maple 9.5.1> with(MmaTranslator):
        FromMma("Integrate[z^2(z-1)^2, {z, 0, 1}]");

        Error, (in MmaCharacter["^"]) The form, a^b^c, is found \
        in the expression. It means either (a^b)^c or a^(b^c). P\
        lease use parentheses to clarify the meaning
```

EXPECTED: int(z^2*(z-1)^2,z = 0 .. 1)

CHECKUP: FromMma("Integrate[z^2 (z-1)^2, {z, 0, 1}]");

```
        int(z^2*(z-1)^2,z = 0 .. 1)
```

COMMENT: In the Mathematica language, the following expressions A\
and B are considered to be identical

```
        z^2(z-1)^2      #  expressions A

        z^2 (z-1)^2     #  expressions B
```

……...

Example 138. GUI vs command line

cwmaple9.5.exe> evalf(Int(Int(1/x, x= y..1), y= 0..1));

Error, (in evalf/int/control) too many levels of recursion

cmaple9.5.exe> evalf(Int(Int(1/x, x= y..1), y= 0..1));

1.000000000

……...

Example 139. GUI vs command line

cwmaple9.5.exe> int((1-z)^(-1+I), z=1.1..infinity);

Error, (in evalf/int/control) too many levels of recursion

cmaple9.5.exe> int((1-z)^(-1+I), z=1.1..infinity);

Float(undefined)

……...

Example 140. GUI vs command line

cwmaple9.5.exe> evalf(Int(sinh(I*z^I), z= 0..infinity));

Error, (in evalf/int/control) too many levels of recursion

cmaple9.5.exe > evalf(Int(sinh(I*z^I), z= 0..infinity));

Int(1.*I*sin(z^(1.*I)),z = 0. .. Float(infinity))

……...

Under the risk of ... Speaking figuratively, the evolution of Maple during 1998-2002 reminds a phase transition of the second kind. Maple 8 was a kind of the point where

"software+quality+of+Maple"

"software+quality+of+Maple+bugs"

Initial remarks

cavalier attitude

1. Maple Bugs Encyclopædia upgrade holding 10000 Maple bug manifestation is coming.

http://www.bl.physik.tu-muenchen.de/rechner/MuPAD/RELEASE_122/CT-TEST/CT_test.html

http://sci.tech-archive.net/Archive/sci.math.symbolic/2004-06/0042.html

embarras de richesse

===> shell out your money! (ms)

http://www.i-math.com.sg/maple9Launch.html

Maple 9 astonishes the world in the latest release of its general-purpose mathematical problem solving software.

Astonishes? This is true.

http://www.maplesoft.com/pressroom/releases/2003/maple9.shtml

"Our users have told us time and again that they consider Maple to be the friendliest and most accessible math software package on the market. We've worked hard to ensure that Maple 9 continues to deserve this reputation," says Dr. Tom Lee, Vice President of Marketing and Executive Product Director at Maplesoft. He adds, "As with each new release of Maple, we strive to supply new and better algorithms to researchers who take on the most difficult computational tasks in their fields."

http://www.engineering.com/content/footer/investor/2001_archive/waterloomapledeliversonlinecomputation.jsp?disciplineID=mechanical&tabID=100&subTabID=130

===> James Cooper

"Online technical computation will quickly become an important tool for engineers," stated James Cooper, P.Eng., President of Waterloo Maple Inc. "Our solutions promise the flexibility, ease-of-use, and convenience that traditional engineering computing simply cannot provide. Launching them through ENGINEERING.com will help us expand on our existing stronghold in education and research, while adding practicing engineers of all disciplines around the world."

"I know that it's difficult for the rest of the world to understand, but engineers actually love this stuff. Whether it's the application of advanced Calculus or integration theory, mathematics is the universal language of engineering. It is something that we learn to "speak" during our formal education – no matter what part of the world we're in – and we use it for the rest of our professional careers," said Frank Baldesarra, P. Eng., President and CEO of ENGINEERING.com Incorporated. "Maple is adding a unique new dimension to both ENGINEERING.com and to the engineering community, at the same time it's general applicability sets a new standard in dynamic web resources."

Some Bug Facts (from Airland Battle Doctrine)

User-Oriented (/ User-Based) Approach To Quality

Maplesoft QA Process (Beta Testing, Night Testing Etc)

From: Vladimir Bondarenko <vvb@mail.strace.net>
Subject: [MUG] Waterloo Maple, Inc. testing standards?
Date: Thu, 30 May 2002 07:16:58 +0400

>> From: Vladimir Bondarenko <vvb@mail.strace.net>

Hello,

What software testing standard(s) Waterloo Maple, Inc. uses?

Any directions or hints are really appreciated.

Vladimir Bondarenko
Applied mathematician

Maple-Oriented Groups And Their Impact

1. Currently, the most active group for discussing any kinds of problem in Maple.

http://groups.google.com/groups?hl=en&lr=&ie=UTF-8&oe=UTF-8&safe=off&group=comp.soft-sys.math.maple

2. Give and receive help for the mathematical software Maple.
Questions at all levels are welcome.

http://groups.yahoo.com/group/**maple-assist**/

3. Discussing bugs in Maple 9, suggestions for improvement, and differences with earlier versions of Maple. This group is NOT for general questions about Maple.

http://groups.yahoo.com/group/maple-new/

4. Three servers fully dedicated to description of Maple bugs and workarounds in all versions, to be reinforced dramatically within the span of the several upcoming months

http://www.cybertester.com/
http://maple.bug-list.org/
http://www.CAS-testing.org/

There are also 2 inactive now groups where a lot of useful info could be found.

5. The Maple User Group (MUG) was an electronic mailing list designed to give Maple users an opportunity to discuss applications, problems and issues with other users.

Monthly digests from January 1998 through February 2003 are available as text files from
http://www.scg.uwaterloo.ca/~maple_gr/Digests/

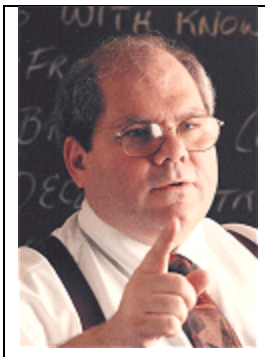
6. Discussing bugs in Maple 8, suggestions for improvement, and differences with earlier versions of Maple. This group is NOT for general questions about Maple.

http://groups.yahoo.com/group/maple8/

Software Customer Bill Of Rights

Software customers, know your **rights**

to use that **software**. For more on your basic **rights** as a **customer**, go to www.amrresearch.com, a research company composing a **bill** of **rights** for enterprise **...**



Ph.D. in experimental psychology from McMaster University, 1984
J.D. in law from Golden Gate University, 1994
Professor of Software Engineering at Florida Institute of Technology
Director of Florida Tech's Center for Software Testing Education & Research

My career is centered around a consistent theme:

Enhancing the satisfaction and safety of software customers, users, and developers.

http://blackbox.cs.fit.edu/blog/kaner/archives/000124.html

Cem Kaner's weblog Software testing, software safety, software law.

August 27, 2003

SOFTWARE CUSTOMER BILL OF RIGHTS

As the software infrastructure has been going through chaos, reporters (and others) have been called me several times to ask what our legal rights are now and whether we *should* all be able to sue Microsoft (or other vendors who ship defective software or software that fails in normal use).

Unfortunately, software customer rights have eroded dramatically over the last ten years. Ten years ago, the United States Court of Appeals for the Third Circuit flatly rejected a software publisher's attempts to enforce contract terms that it didn't make available to the customer until after the customer ordered the software, paid for it, and took delivery. Citing sections of Uniform Commercial Code's Article 2 (Law of Sales) that every law student works through in tedious detail in their contracts class, the Court said that the contract for sale is formed when the customer agrees to pay and the seller agrees to deliver the product. Terms presented later are proposals for modification to the contract. The customer has the right to keep the product and use it under the original terms, and refuse to accept the new, seller favorable terms. Other courts (such as the United States Court of Appeals for the First Circuit) cited this case as representative of the mainstream interpretation of Article 2. Under this decision, and several decisions before it, shrinkwrapped contracts and clickwrapped contracts (the ones you have to click "OK" to in order to install the product) would be largely unenforceable.

The software publishing community started aggressively trying to rewrite contract law in about 1988, after the United States Court of Appeal for the Fifth Circuit rejected a shrinkwrapped restriction on reverse engineering. That effort resulted in the Uniform Computer Information

Transactions Act and a string of court decisions, starting in 1995, that make it almost impossible to hold a software company liable for defects in its product (unless the defect results in injury or death)-- even defects that it knew about when it shipped the product -- and also very difficult to hold a mass-market seller liable for false claims about its product. (For background, see InfoWorld and Kaner's Software Engineering & UCITA in the section on Forcing Products Liability Suits into Arbitration).

So what should we do about this? There are some strong feelings to hold companies fully accountable for losses caused by their products' defects.

I'd rather stand back from the current crisis, consider the legal debates over the last 10 years, and make some modest suggestions that could go a long way toward restoring integrity and trust -- and consumer confidence, consumer excitement, and sales -- in this stalled marketplace.

1. Let the customer see the contract before the sale. It should be easy for customers of mass-market software products and computer information contracts to compare the contract terms for a product, or for competing products, before they download, use, or pay for a product. (NOTE: This is not a radical principle. American buyers of all types of consumer products that cost more than $15 are entitled to see the contract (at a minimum, the warranties in the contract) before the sale).

2. Disclose known defects. The software company or service provider must disclose the defects that it knows about to potential customers, in a way that is likely to be understood by a typical member of the market for that product or service.

3. The product (or information service) must live up to the manufacturer's and seller's claims. A statement by the vendor (manufacturer or seller) about the product that is intended to describe the product to potential customers is a warranty, a promise that the product will work as described. Warranties by sellers are defined in UCC Article 2 Section 313. Manufacturer liability is clarified (manufacturers are liable for claims they make in ads and in the manual) in a set of clarifying amendments to Article 2 that have now been approved by the Permanent Editorial Board for the UCC, which will be probably introduced in state legislatures starting early in 2004. In addition, it is a deceptive trade practice in most states (perhaps all) to make claims about the product that are incorrect and make the product more attractive. For example, under the Uniform Deceptive Trade Practices Act, Section 2(5) it is unlawfully deceptive to represent "that goods or services have sponsorship, approval, characteristics, ingredients, uses, benefits, or quantities that they do not have." UCITA was designed to pull software out of the scope of laws like this, which it did by defining software transactions as neither goods nor services but licenses. We should get rid of this cleverly created ambiguity.

4. User has right to see and approve all transfers of information from her computer. Before an application transmits any data from the user's computer, the user should have the ability to see what's being sent. If the message is encrypted, the user should be shown an unencrypted version. On seeing the message, the user should be able to refuse to send it. This may cause the application to cancel a transaction (such as a sale that depends on transmission of a valid credit card number), but transmission of data from the user's machine without the user's knowledge or in spite of the user's refusal should be prosecutable as computer tampering.

5. A software vendor may not block customer from accessing his own data without court approval.

6. A software vendor may not prematurely terminate a license without court approval. The issue of vendor self-help (early termination of a software contract without a supporting court order) was debated at great length through the UCITA process. To turn off a customer's access to software that runs on the customer's machine, the vendor should get an injunction (a court order). However, perhaps a vendor should be able to deny a customer access to software running on the vendor's machine without getting an injunction (though the unfairly-terminated customer should be allowed to get a court order to restore its access.)

7. Mass-market customers may criticize products, publish benchmark study results, and make fair use of a product. Some software licenses bar the customer from publishing criticisms of the product, or publishing comparisons of this product with others or using screenshots or product graphics to satirize or disparage the product or the company. Under the Copyright Act, you are allowed to reproduce part of a copyrighted work in order to criticize it, comment on it, teach from it, and so on. Software publishers shouldn't be able to use "license" contracts to bar their mass-market customers from the type of free speech that the Federal laws (including the Copyright Act) have consistently protected.

8. The user may reverse engineer the software. Software licenses routinely ban reverse engineering, but American courts routinely say that reverse engineering is fair use, permissible under the Copyright Act. Recently, California courts have started enforcing no-reverse-engineering bans in software licenses. This is a big problem. Software publishers claim that reverse engineering is a way to steal their work. There are many legitimate, important uses of reverse engineering, such as exposing security holes in the software, exposing and fixing bugs (that the manufacturer might not fix because it is unwilling, unable, or no longer in business), exposing copyright violations or fraudulent claims by the manufacturer, or achieving interoperability (making the product work with another product or device). These benefit or protect the customer but do not help anyone unfairly compete with the manufacturer.

9. Mass-market software should be transferable. Under the First Sale Doctrine, someone who buys a copyrighted product (like a book) can lend it, sell it, or give it away without having to get permission of the original publisher or author. Similarly, if you buy a car, you don't have to get the car manufacturer's permission to lend, sell, or donate your car. UCITA Section 503(2)allows mass-market software publishers to take away their customers' rights to transfer software that they've paid for. It should not.

10. When software is embedded in a product, the law governing the product should govern the software. Think of the software that controls the fuel injectors in a car. Should the car manufacturer be allowed to license this software instead of supplying it under the basic contract for the sale of the car? (Paper 1) (Paper 2). Under extended pressure from the software industry, the Article 2 amendments specify that software (information) is not "goods" and so is not within the scope of Article 2, even though courts have been consistently applying Article 2 to packaged software transactions since 1970. In the 48 states that have not adopted UCITA, this amendment would mean that there is no law in that state that governs transactions in software. The

courts would have to reason by analogy, either to UCITA or to UCC 2 or to something else. When a product includes both hardware (the car) and software (the fuel injector software, braking software, etc.), amended Article 2 allows the court to apply Article 2 to the hardware and other law to the software. Thus different warranty rules could apply and even though you could sell your car used without paying a fee to the manufacturer, you might not be able to transfer the car's software without paying that fee. Vendors should not be able to play these kinds of games. "Embedded software" is itself a highly ambiguous term. In those cases in which it is unclear whether software is embedded or not, the law should treat the software as embedded.

Posted by kaner at August 27, 2003 12:30 AM

Maple Customers' Opinions

Nomination: 100 Most Absurd Maple Bugs

Hardware Specification

Free Maple Patches

Read full story

Jul 23, 2001 comp.soft-sys.math.maple
Richard B. Kreckel, Re: Does maplesoft force upgrades to get bugs fixed? Opinions wanted ...

[…]
when I look at the bugs that surface with each new version of Maple I get the impression that their QA people are really having a serious problem.
[…]
if an easy and safe patch is possible, a software manufacturer should distribute them. I wonder if Waterloo Maple has stopped this practice? If I look into the directories under ftp://ftp.maplesoft.com/pub/maple/downloads/service_packs/ I see updates for MapleVR3 and MapleVR4 and empty directories for the newer versions. Very sad, indeed...

Statistics & Diagrams

Cyber Tester: A User's Control Shell Over Maplesoft

Wish List

Quick start of Standard worksheets.

Preprocessing.

Internal algorithms knowledge base controlled by an oracle.

Interactive help

Asymptotic -> integral calculation

Translate Maple code from/into MMA, MuPAD, Derive

Add the Pause button.

Rewrite error messages in a user-friendly way, making them sounding like hints for the user on how to proceed.

Math dictionary should not be an alien, mechanically propped to the whole, part of Maple, like a ladder against a wall, as it is the case now, but rather should involve Maple's functionality organically. For example, Math Dictionary's *odd* entry should refer to *type/odd* etc

Kernel + Frontend

Optional self-verification mode

Tableaux

Another valuable new feature is the Knowledge Management dictionary of mathematical terms, which can be used to help you find your way through a topic. For a first edition this is very good but a few more formulae and even the occasional chart would be welcome improvements. More important for the beginner are the assistants which help you create Maple worksheets that solve problems for you. There is also a new range of educational 'tutors' for pre-calculus through one- and multi-variable calculus to linear algebra. These are really just worksheets where you can increase your understanding by adjusting parameters. In most cases, though, if you don't know what the point of the exercise is, then you won't have much of an idea of what is going on.

Top 10 Reasons to Think Before Investing in Maple

1.

Maplesoft's Survival Kit

Can Maplesoft survive at the symbolic market?

1. Release FREE bug fixes. The customers should pay for Maplesoft's competence, not for Maplesoft's incompetence.
2. Attract Maple Experts, on paid basis, for analysis of the crisis and planning the best anti-crisis measures.
3. Create a publicly accessible Maple bug workarounds database, at least encompassing the most typical cases..
4. Stop waste much resource to further pushing of whistles & bells like Maplets.
5. As soon as possible give the customer access to *powerful* verification procedures within Maple so that in case of doubt he/she could efficiently test Maple's output – at least for the most important functions like int(), limit() etc.
6. Refine & reinforce several critical procedures like series/asympt to get fast success in several directions.
7. Use the NAG power better; if possible, increase cooperation level with NAG Ltd.
8. Focus temporarily on the Maple computational engine until a tangible amount of Maple bugs is not fixed.

9. Provide free access to ALL Maple versions, except the last one, for all the world (!)
10. Pay especial heed that real-world students examples woiuld be handled correctly.
11. Start communicate with customers directly via Maple oriented forums.
12. Fix Standard worksheets as soon as possible, if not possible, maybe, admit publicly that introducing Standard worksheets was a prematureness. This bold move can capture all hearts.
13. Explain the Maplesoft's staff the criticality of the case, and, temporarily, cut them somewhat the salary to save the resource.
14. Build an automated testing network-based environment which will work overnight when the staff do not use the network
15. Hire a team of Maple fan experts requiring low salary in the Russia or elsewhere to extend Maple functionality.
16. Via showing respect to the studentship, e.g. fixing student-level bugs, win theirs hearts & pocket-books
17. For 1-2-3 years, set even a lower price for student's versions.
18. Secure syntax/worksheets compatibility & inform the Maple community about the concrete steps toward stability.
19. Consider Maple (partial?) re-factoring.
20. Always remember that

    Good plan violently executed now, is better than a perfect plan next week.

    -- George S. Patton, American General

Conclusions

Future Work

Acknowledgements

Joe Riel, Helmut Kahovec, Carl DeVore, Alec Mihailovs, Preben Alsholm, Harald Pleym, Dave Rusin, Nigel Backhouse, Bill Page, Glenn (sabreur@mac.com), Les Wright, Bernard Marcheterre, John O Connor, Robert Israel, Joachim Goetz, Sunil Koswatta, Rouben Rostamian, Robert Michael Sinclair, Douglas B. Meade, William F. Moss, Simon Plouffe, Don Hartig, Volker Braun, Peter L. Montgomery, Steve Thomason, Diane Evans, Francis Sergeraert, William (Bill) Bauldry, Rachid Malti, Marc A. Murison, Humberto Jose Bortolossi, Wolfgang Ziller, N. J. A. Sloane, Edwin Clark, Ferdinand Gleisberg, Ian Billups

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There's still much to Derive after the Texas takeover
Scientific Computing World,August- September/2000:34-35

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[5] G Gamble and Grant Keady, MapleNet and Maplets under Maple 8, MSOR Connections, February 2003

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[7] S.S. Ross, Maple 6: The Analytical Engine, NASA Technical Briefs, July 2000

[8] Ian Sammis, Maple 6 July 2000, MacAddict http://macaddict.com/issues/0007/rev.maple6.html

Maple doesn't separate its notebook interface from its kernel (the code that actually does the mathematics) as Mathematica does. This means Maple has snappier performance at the cost of some flexibility. You can't connect the notebook interface on a weak computer to the kernel on a stronger one, for example.

While users will certainly appreciate the ability to import and use C and FORTRAN code, it's poorly documented — a fairly gross sin in the world of development.

Maple's vast power occasionally leads to irritating notational games when you're trying to accomplish relatively simple tasks - you have to strip the O(x^n) term manually from series expansions if you want to use them in further calculations, for example.

BAD NEWS: Poor platform-specific documentation.

[8] Nigel Backhouse, Review of Maple V Release 5, Math&Stats Vol 9, No 3, Aug 1998

[9] Peter Whitworth, Review of Maple V Release 4, Math&Stats Vol 8, No 1, Feb 1997

[10] Reza O. Abbasian, Adrian Ionescu, Case Studies In The Shortcomings Of Maple In Teaching Undergraduate Mathematics

[11] David Harper, The Maple Computer Algebra System

[12] Bill Anderson, Maple V2 Student Version for Windows

[13] J.H. Davenport, Y. Siret and E. Tournier

[13] Davenport, On Integration...

[14] Richard J. Fateman, On the Design and Construction of Algebraic Manipulation Systems, 1990

[14] Dominik Gruntz, On Computing Limits in a Symbolic Manipulation System, 1996, Diss. ETH No. 11432

[15] Kelly Roach: Meijer G Functions Representations. Pp 205-211, Proceedings of the 1997 International Symposium on Symbolic and Algebraic Computation, ISSAC '97, Maui, Hawaii, USA, July 21-23, 1997. ACM Press, 1997

[15] Kelly Roach: Hypergeometric Function Representations, 1996, International Symposium on Symbolic and Algebraic Computation.

[10] Robert Israel, Maple Advisor Database http://www.math.ubc.ca/~israel/advisor/

[15] Salvy

[16] Trager

[17] Bronstein
[17] Buchberger

[18] Abramov

[19] Michael Wester,

[20] Carl M Bender and Stephen A Orszag, Advanced Mathematical Methods for Scientists and Engineers, McGraw-Hill Book Company, New York, 1978,

[1] Abramov, S.A.; Carette, J.J.; Geddes, K.O.; and Le, H.Q. "Symbolic Summation in Maple." Technical Report CS-2002-32, School of Computer Science, University of Waterloo, Ontario, Canada**.** (2002).

[2] Abramov, S.A. "Indefinite Sums of Rational Functions." Proceedings ISSAC'95**.** (1995): 303-308.

[3] Gosper, R.W., Jr. "Decision procedure for indefinite hypergeometric summation." Proc. Natl. Acad. Sci. USA**,** 75, 1977, 40--42.

[4] Petkovsek, M.; Wilf, H.; and Zeilberger, D. **A=B,** Wellesley, Massachusetts: A. K. Peters Ltd., 1996.

[5] Abramov, S.A. and Petkovsek, M. "Rational normal forms and minimal decompositions of hypergeometric terms". **Journal of Symbolic Computation** 33, No. 5, 521--543, 2002.

[6] Koepf, W. "Algorithms for m-fold Hypergeometric Summation." **Journal of Symbolic Computation**. (1995): 399-417. Vol. **20**. No. 4.

[7] Abramov, S.A. and van Hoeij, M. "Integration of Solutions of Linear Functional Equations." **Integral Transformations and Special Functions**, (1999): 3-12. Vol. **8**. No. 1-2.

[8] Zeilberger, D. "The Method of Creative Telescoping." **Journal of Symbolic Computation**. (1991): 195-204. Vol. **11**.

[9] van Hoeij, M. "Finite Singularities and Hypergeometric Solutions of Linear Recurrence Equations." **Journal of Pure and Applied Algebra**. (1999): 109-131. Vol. **139**.

[10] Abramov, S.A. and Zima, E.V. "D'Alembertian Solutions of Inhomogeneous Linear Equations (differential, difference, and some other)." **Proceedings ISSAC'96**. (1996): 232-240.

[11] Prudnikov, A. P.; Brychkov, Yu.; and Marichev, O. **Integrals and Series, Volume 3: More Special Functions**. Gordon and Breach Science Publishers, 1990.

[12] Roach, K. "Hypergeometric Function Representations." **Proceedings ISSAC 1996**. ACM Press, New York. (1996): 301-308.

MAKE VM AS BACKGROUND UNDER THE TRANSPARENT JET !!! (ms)

The End Of Part I

Maple is one of the most powerful commercial computer algebra systems produced by Maplsoft, Inc www.maplesoft.com.

```
Maple 9.5.1 > vint(arccsc(z), z= 0..1/2);

GEMM: ATTENTION!

The answer produced by Maple 9.5.1 is invalid because:

1) the integrand is continuous over 0..1/2
2) the approximation of the symbolic answer differs from the output of the
quadrature by .2e-9+1.316957896*I

A correct answer identified by GEMM is

1/2*I*Pi+1/4*Pi-1/2*I*ln(2+3^(1/2))-ln(2)+ln(1-I*3^(1/2))
```

Surprisingly, Maple recent development, since about 2000 on, should be considered as a crash program. Wernher von Braun, *Crash programs fail because they are based on theory that, with nine women pregnant, you can get a baby a month.*

Can **Maple** be trusted? Israel

```
> sum((k+1)*a^k,k=2..infinity);
```

http://www.math.ubc.ca/~israel/advisor/advisor5/a14r1.htm

Advice: Can Maple be trusted?

	Any very large software project has bugs, and Maple has plenty of them.

Any very large software project has bugs, and Maple has plenty of them. You should not have blind faith in Maple, or any other computer algebra system, or a human for that matter. Use the same general guidelines that you might apply to something one of your colleagues might have come up with (after a long and complicated calculation): first ask yourself if the answer appears to be reasonable, and then check it if possible. Try some special cases, a different method of calculating the answer, or verify some consequences of the answer.

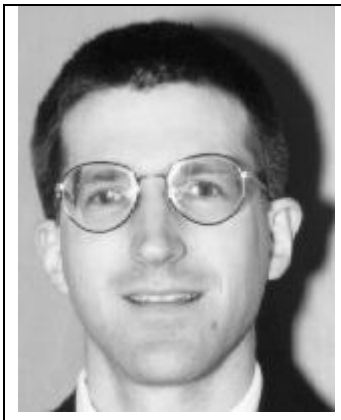
In a situation where an error might have serious consequences, be especially diligent in checking the answer. You might even try it on another computer algebra system.

See also: Finding a bug

Maple Advisor Database R. Israel 1997

MapleNet http://www.maplesoft.com/maplenet/

MapleTA http://www.maplesoft.com/mapleta/.



DOUGLAS B. MEADE

MAPLE AND ITS ROLE IN THE DEVELOPMENT OF A MATHEMATICIAN

I look forward to 2024 and hearing a review of the next twenty years at an event such as the Maple Summer Workshop.

Read full story

Dec 28, 2003 comp.soft-sys.math.maple
Harald Pleym, Re: euler(0,1) shows Maple bugs are really ubiquitous

Sorry to say, but I think Maplesofts days are numbered.

Rafal Ablamowicz	http://groups.yahoo.com/group/maple8/message/183 Oct 26, 2002 comp.soft-sys.math.maple **I strongly support the idea of having a site listing Maple bugs as posted by Vladimir Bondarenko and commented on by Bertfried Fauser**

Read full story

From: Thomas P. Witelski (witelski@math.mit.edu)
Subject: ANOTHER Maple Bug?
Newsgroups: sci.math.symbolic
Date: 1996/08/18

I'm losing faith in MAPLE:

Maple V R 3> int(x*(1-x^2),x=0..1);
-1/4

Oct 1, 2002 comp.soft-sys.math.maple Carl DeVore

Some users are getting very frustrated with the lack of public information about bugs. I believe that if nothing is done to address this issue, then Maple will quickly become a system which is only useful for teaching calculus and other low-level courses. It will be useless for research.

Download the paper [141 Kb]

Richard J. Fateman
On the Design and Construction of Algebraic Manipulation Systems

We compare and contrast several techniques for the implementation of components of an algebraic manipulation system.

On one hand is the mathematical-algebraic approach which characterizes (for example) IBM's Axiom.

On the other hand is the more ad hoc approach which characterizes many other popular systems.

Read full story

```
From: Halvor Mehlum <halvor.mehlum@econ.uio.no>
Subject: [MUG] BUG again
Date: Tue, 06 Nov 2001 11:22:58 +0100

I reported the following bug to maplesoft a year back when I was running maple 6
I just tried the same in Maple 7.  The bug is still there!!! when running

  a1 := .9*(.9+8.*exp(-1))*exp(.1*tt)/(1+8*exp(-1)):
  b1:=int(exp(-tt)*ln(a1),tt=t..1):
  c1:=evalf(subs(t=0.5,b1));
  a2:=simplify(a1):
  b2:=int(exp(-tt)*ln(a2),tt=t..1):
  c2:=evalf(subs(t=0.5,b2));

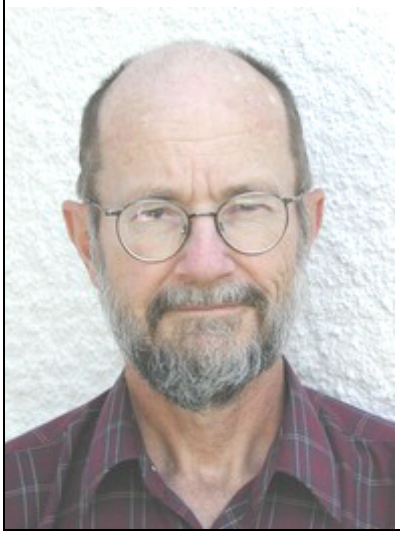
I get

c1 := -.02000179736
c2 := -.01387124953

This is not correct they should both be the same. Should I trust a company that does
not fix known bugs?

Hal

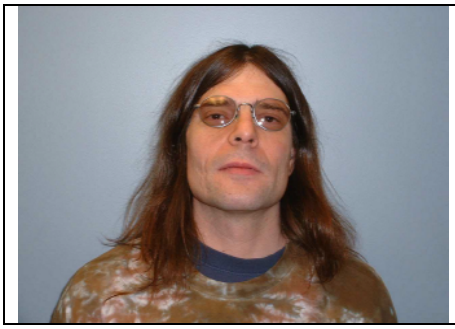
============================================
Halvor Mehlum http://folk.uio.no/hmehlum/
Ragnar Frisch Centre for Economic Research
Department of Economics, University of Oslo
Box 1095, Blindern
0317 Oslo Norway
Phone : +47 22855152 Fax: +47 22855035
============================================
```



Read full story Dec 7, 2001 MUG
Preben Alsholm, Re: Problems with Random Tools

I used to report bugs to 'support', but have stopped doing that. Now I just use the newsgroup comp.soft-sys.math.maple.

I would be very surprised, if the Waterloo Maple people don't read that. The advantage is that the bug is made public.



Sep 17, 2002-09-17 comp.soft-sys.math.maple

A public bug-reporting system would be a great idea.

Read full story

July 7, 2003 2003-07-17 comp.soft-sys.math.maple mike777788888@yahoo.co.uk

Subject: Re: Maple 9 major problems.

http://groups.google.com/groups?dq=&hl=en&lr=&ie=UTF-8&oe=UTF-8&safe=off&selm=3f42762c.0307172124.4093511%40posting.google.com&rnum=3

Maplesoft has advertised the new interface in big letters when pushing this product to its customers. If this does not work (and it does not for number of people using windows), then the least we can expect is to get our money back or be provided with an immediate solution.

I contacted Maplesoft, and they basically have ignored me so far. They do not seem to be willing to return my calls or willing to return my money.

Maplesoft have not even mentioned this major flow on its web page, it is completely silent about it as if it wants to bury it under the carpet by not talking about it. Even here, no one from Maplesoft is willing to come in and comment on this problem so far. Shows how Maplesoft cares about its customers.

I will never again buy anything from Maplesoft.

Read full story

```
From: mike (mike777788888@yahoo.co.uk)
Subject: Re: Maple 9 major problems.
Newsgroups: comp.soft-sys.math.maple
Date: 2003-07-19 09:49:55 PST

Maple9w.exe should, when coming up, have in it the classpath setup such as to point to
its own java, and not depend on how the user have set the environment variable
classpath.

Any sane and well designed application must do this, else the application will one day
work, and another day not work depending on how the user have set their classpath on
that day. And indeed, this is how applications work which uses their own JRE.

It does not matter what the user have set the classpath path to, the application will
not use this setting to locate java, but will instead explicitly point to its own
java, by having the path hardcode to its own java relative to the root of the
```

application installation.

Read full story

I asked for the patch and never got it. Then a new release of maple V (release 5.1 if I remember well) was released and the French distributor of Maple (Integral Software) gave it to our lab for free to replace our 5.0 version. The bug was still not corrected. I gave up.

We bought Mathematica, and are quite happy with it. And, I STRONGLY advise to never buy anything from Maple software.

Professor Jean-Marc Alliot
Global Optimization laboratory director
Centre d'Etudes de La Navigation Aщerienne / Ecole Nationale de
l'Aviation Civile
31055 Toulouse Cedex 04

www.recherche.enac.fr/~alliot/

Read full story

Yuri Muzychka, Bug in [DEtools,Dchangevar] in Maple V.4 (8.9.97)

I have noticed the bug in DEtools a long time ago. I had sent Maple a worksheet summarizing where the bug occurs, but never received any follow up.

Read full story

Subject: Re: About Maple Bugs
Author: jean-marc alliot <alliot@recherche.enac.fr>
Organization: Laboratoire d'Optimisation Globale
Date: Fri, 18 Feb 2000 16:05:32 +0100

I have been writing software and teaching graduate students to write programs for 20 years and I will never consider the answer to a bug report to be good if the bug is not corrected two years later.

I have been reporting bugs for a large number of software, commercial and non-commercial, and I have up to now always seen the bug corrected sooner or later.

Bugs are always present, that's true, but the first thing that a responsible programmer has to do is to correct them.

I never care about a bug and I am even always eager to help correcting it; we are all humans and we all make mistakes.

Sometimes correcting them is difficult, expecially when you can't easily reproduce them (a very common problem in operating system). But I do not like commercial software where reproducible serious bugs are not corrected.

Professor Jean-Marc Alliot
Global Optimization laboratory director
Centre d'Etudes de La Navigation Aщerienne / Ecole Nationale de
l'Aviation Civile
31055 Toulouse Cedex 04

www.recherche.enac.fr/~alliot/

Read full story

```
DK> I am using MapleV rel. 3 on intel linux.
DK> seq(a(i), i= 1..3);
Error, (in product) product variable previously assigned,
second argument evaluates to, 1 = 0 .. 0

Why should the user be burdened with having to `protect' the
expression and the variable from interference with global
variables elsewhere in the session?

There may perhaps be extraordinary circumstances where it might
be useful that the global value of the indexing variable affect
a calculation like this, but by far and away, this is not what
the ordinary users want.
```

Read full story

```
DK> I am using MapleV rel. 3 on intel linux.
DK> seq(a(i), i= 1..3);
Error, (in product) product variable previously assigned,
second argument evaluates to, 1 = 0 .. 0

So what's the lesson here?  Always use unique names?  Always
program defensively?  Never make unwarranted assumptions?  Or
maybe ...
```

Make developers and users interact more???

Read full story May 19, 1998 sci.math.symbolic

Rachid Malti, Re: Surprising BUG in Maple V release 4

Nowadays, if a software is to be competitive in the market, it HAS TO get adapted to user needs and not vice versa.

I, as a user, have some mathematical problems to solve and need a ready to use tool as intuitive as possible. I DONNOT have any time to loose looking after some syntaxes because "Waterloo software" has decided not to make them intuitive. The problem I had is glaringly an obvious example.

COMMENT: … so you spend more time learning the subject, not the software. See also Wester (ms)

Read full story

Feb 19, 1998 sci.math.symbolic André Pönitz, Re: Maple Website, where are you? What happened?

And gone are the times of lousy user support, times when you got answers like 'yes, **this is a bug**. we are sorry. you might try the following workaround: ...' - and the workaround did the job.

Nowadays the user support is up to date:

'Buy our newest release, and you are rid of that feature'. Those are the words the preferred customer wants to hear, because he hears them everday from the person who sold him his operating system. And from the person who sold him his word processor. And from the person .....

And of course, the newest release is only available for one operating system. But fortunately we already know the person who sells it. And that closes the circle do the wonderful colourful informative homepage...

Sorry to say that, I've always been thinking of me as a **Maple** supporter when it came down to religious wars between computer algebra systems. But the recent developments makes me think I am purchasing the wrong system from the wrong salesperson...

Andre' Poenitz

--
Andre' Poenitz, TU Chemnitz-Zwickau, Fakultaet fuer Mathematik
poenitz@mathematik.tu-chemnitz.de ..... +49 3727 58 1381

Read full story

Jul 17, 2003 comp.soft-sys.math.maple mike, Maple 9 major problems

A great example of modern software production is in front of us.

Companies hurry to push software out of the door as quickly as possible with little quality control and

testing even thought it still contains major bugs. Customers end up paying the cost for the sloppy software.

Read full story

Feb 17, 2004 comp.soft-sys.math.maple Jeanne Clelland, Maple 9 and Mac questions

2) I can't get Maple 9 to open Maple V.5 or Maple 7 worksheets – is there any way to do this?

3) Maple 9 chokes on reading text files that Maple V.5 and Maple 7 are perfectly happy with. I've tried setting the interface(echo) level higher to see what's going on, and Maple 9 spits out gobbledygook that makes me think that maybe it's not interpreting Mac linebreaks correctly - the lines are broken up in funny places, and there are lots of extra # characters. Does anyone know if this is, in fact, what's going on (and if so, did ANYBODY actually test this thing on a Mac before releasing it???), and is there any way around it? If I can't read in text files, I'm seriously tempted to return the damn thing for a refund.

Ladies, being also a science historian, I cannot ignore the facts, - but I warn that this honest story is not for you. Please go to the next comment by this link.

Read full story

May 10, 2004 comp.soft-sys.math.maple Jacques M. TORRE, Is Maplesoft dishonest ?

I bought Maple 9 for Mac OS X approximately 8 months ago.

The conversion of my old files Maple 7 towards Maple 9 is still not entirely possible (certain characters are still not recognized in Maple 9). Moreover, printing with Maple 9 is catastrophic (for example setting parameters are ineffective).

I contacted Maplesoft, at the time of each version, and I explained all these nuisances.

Same answer each time : "All the problems you mention have been forwarded to our developers for further investigation. Thank you for bringing them to our attention".

Release 9.03 did not correct anything of the bugs above.

Under these conditions I expected that the update towards version 9.5 is free.

And NOT !! It costs 600 euros (in France).

Does it correct at least the troubles which I met ?
Not sure ...

On the other hand what is sure, is that Maplesoft regards its customers as packages of shit !

Read full story May 10, 2004 comp.soft-sys.math.maple
Jean-Michel Collard, Re: Is Maplesoft dishonest ?

What *I* am interested in is to know if someone has tested the new java (**spit**) GUI and if it has been improved.

The whys and the wherefores Maplesoft chosed java is far beyond my comprehension.

We are supposed to do math with Maple (and with any CAS) not to care about GUI "features".

Read full story Jul 15, 2003 comp.soft-sys.math.maple
nma124@hotmail.com (steve_H), Re: Maple 9 java problem

I bought maple9 to use the new interface and if this is broke,
I'd like to return this product and get my money back.

Read full story Jul 12, 2000 sci.math.symbolic
J.R. Chaffer, Maple - Nonfunctional, no support

Hi - just a tip for someone considering purchase of the Maple 6 for Students package. I have been able to get virtually no help at all from the Maple folks at Waterloo. It takes them many days to respond, this last time they have not responded at all. Meanwhile my installation is completely nonfunctional.

Sheesh - what a waste of time and money.

Back to Mathematica - which at least, works at all.

Jrc

Read full story Aug 11, 2000 MUG
J.R. Chaffer, [MUG] Giving up Maple in frustration.

Maple: NOT!

For anyone considering investing in Maple (about $1500 for non-student version, I hear): I have now tried v5r5, and now v6, of student versions. I am finally giving up in frustration. The editor is so very awkward and clumsy, and seems to almost completely lack the easy editing facility built into most Windows programs. The colors seem fixed at an icky red and blue. The documentation is so terrible as to be virtually useless. Thank God I did not invest in the commercial version, nor have to endure the mandatory use (gahhgh) of Maple at a number of institutions - probably the only reason for its success at

all, I would guess.

Compared to many other computer programs, Maple is difficult to use, is often wrong or unable to solve problems, has an extremely awkward editor and virtually undocumented syntax, and is simply an exercise in unneeded frustration. I tried, folks. But why continue to bang my head on the wall? I am switching to the other major program - which at least works, has a usable editor that allows the common select/ copy or cut/paste sequence without EXTREME clumsiness, has many options that actually WORK, has DOCUMENTATION that has far fewer errors, etc etc etc etc etc.... And - did I mention that the level of support for Maple is far, far below that of the major competitor? - at least that is my experience, mostly consisting of nonresponse. Sheesh.

jrchaff

RESCALE THE PICTURE !!!

Download full review [63 Kb]

Maple 9 is the best release of this excellent CAS in terms of mathematical coverage and cosmetics. It suffers two problems. It was released too early, before some major issues, revealed during beta testing were addressed.

As a CAS, with an international student market, it does not properly engage with the real requirements of the learning and teaching community worldwide.

I find the Student package useful in parts in that it provides some interesting pointers for teachers, but it is otherwise rather thrown together.

Read full comments Product Reviews: Maple 9.5 By Mike James

For anyone wanting to move from Mathematica to Maple, there is a new conversion tool. However, this isn't as useful as it might be as it doesn't convert Mathematica programs, which probably form the bulk of the sort of worksheets you might want to use again.

The things are even worse
Place here FromMma bugs

EMP

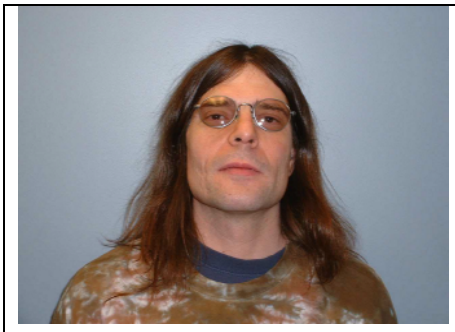
Read full story Oct 15, 2003 comp.soft-sys.math.maple
Robert Israel, Re: Why it's doing so?

There are lots of [Maple] bugs. Please do not use Maple for air traffic control or running nuclear power plants.

Read full story Oct 15, 2003 comp.soft-sys.math.maple
Robert Israel, Re: Why it's doing so?

Every new release corrects some previous bugs (as well as introducing new ones).

Absolutely right. The problem with Maple 9 is that the number and severity of introduced bugs have increased essentially.



Read full story Oct 16, 2003 comp.soft-sys.math.maple
Carl DeVore, Re: Why it's doing so?

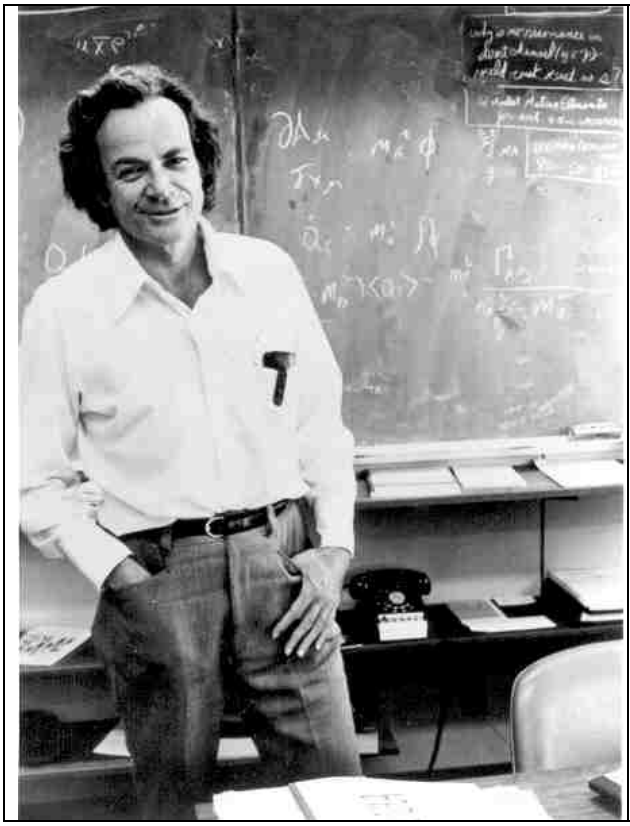
> <%System%> wrote: Does anyone do something with these reported "bugs" (or at least "strange things")?

That question is often asked on this newsgroup. I find it disturbing that (as far as I recall) no-one from Maplesoft ever responds to it. They should have a person part of whose job is to read newsgroups, collect bug reports, and write responses to general questions like yours above.

http://jim.roepcke.com/index/2004/10/13

I'm seriously considering buying Wolfram's Mathematica for Students and Calculus Wiz programs. I used Maple yesterday to work through some problems I couldn't grok and it was great. Sorry Maplesoft, that I would say I used your software and want to buy a competitors... but Maple does not run on OS X natively, I think there might be a Java version but I want something native, since I'm not running a dual G5 here. :-) Despite all of my searching I can't find any information about what Maple can do on the Mac.

Maplesoft'2004: Cargo Cult Science



http://www.virtualschool.edu/mon/SocialConstruction/FeynmanCargoCultScience.html

In the South Seas there is a cargo cult of people. During the war they saw airplanes with lots of good materials, and they want the same thing to happen now.

So they've arranged to make things like runways, to put fires along the sides of the runways, to make a wooden hut for a man to sit in, with two wooden pieces on his head to headphones and bars of bamboo sticking out like antennas — he's the controller — and they wait for the airplanes to land.

They're doing everything right. The form is perfect. It looks exactly the way it looked before. But it doesn't work. No airplanes land. So I call these things cargo cult science, because they follow all the apparent precepts and forms of scientific investigation, but they're missing something essential, because the planes don't land.

http://mathforum.org/epigone/sci.math.symbolic/dwyglabrer/ybwv5hbsblgb@legacy

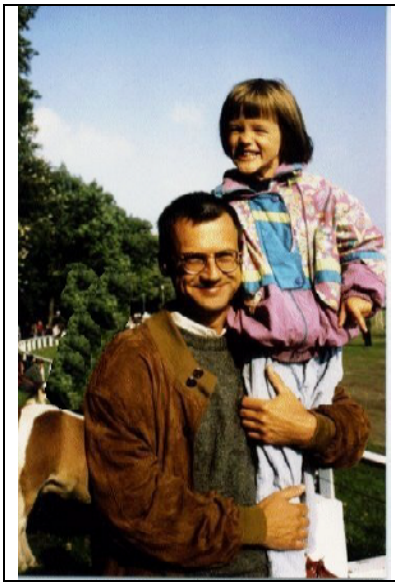
Subject: [FYI] New better Maple versions: step 1 of 3
Author: Vladimir Bondarenko <vb@cybertester.com>
Date: 25 Sep 03 20:02:52 -0400 (EDT)

Do you want to enjoy a math correct, fast and powerful Maple? A rhetorical question.

Industrial modeling, R&D projects, teaching and some other fields would benefit much from new better Maple versions.

To bring them into being is a very difficult goal which Maplesoft seems to be unable to reach solo - judging from its 20+ years experience; in the future we will write a review on the topic.

The time has come to fulfill this our promise.

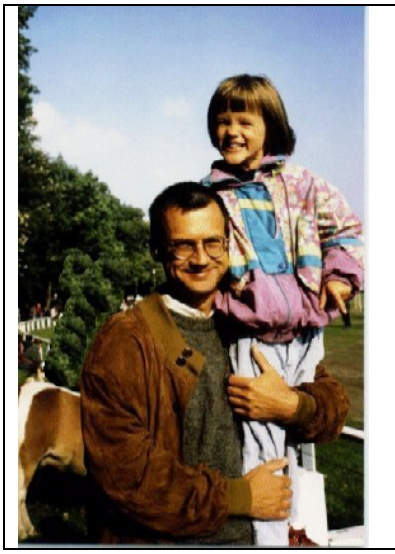


Read full story

I have also called attention (which can be found with google groups) to bugs in Rel. 4 and Rel. 5, and these bug lived happily on in Rel. 6, in Rel. 7 and in Rel. 8 thereafter.

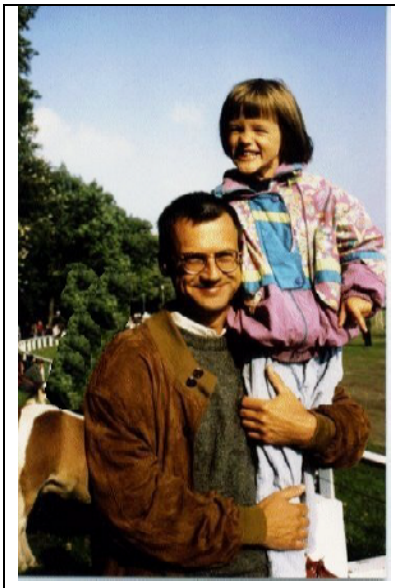
Maplesoft used to ignore bug reports.

If they have changed their politics in this regard (did they really, where is the open database of bugs?) than maybe because the number of people who are willing to pay for pounds of bugs decrease in time, as they can read it in this newsgroup, for example.



Read full story

Pay now for the bugs, be thankful for the bug fixes later



Read full story

This is a bug in the 'logic'. It is a bug like a bug can be! A program is a linear sequence of 'ifs' and jumps, and when you change the order in this sequence you change everything.

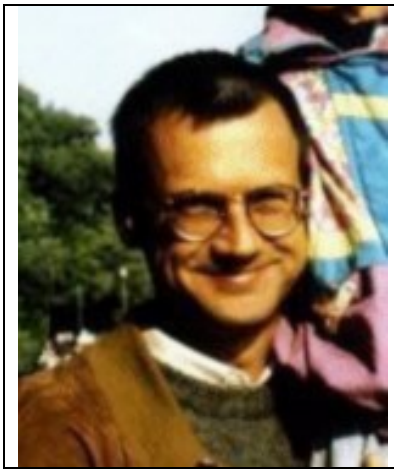
such a bug is well visible by using logic analyzers, flow analyzers and some of the diagram techniques, which are software tools for professional developers throughout the world for years now.

Moreover, the availability of tools to build large bases of test-cases simultaneously with the writing of software, would have certainly also revealed this bug, because the symmetry relation just mentioned which is crucial to the bug would certainly have been used in such an setup.

Maplesoft obviously does not use these tools, and therefore is to be asked why not.

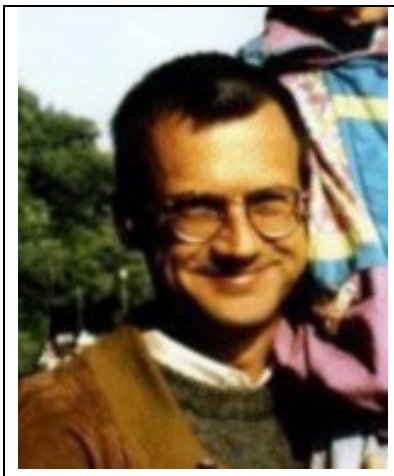
Read full story Jul 6, 2001 comp.soft-sys.math.maple
Dave Rusin, 'eliminate' goofiness

There are several subtleties, theoretical and computational, and I'm accustomed to getting no answer when Maple has run out of ideas. But I'm not accustomed to _wrong_ answers.



Read full story

Yes, Vladimir's marketing is not perfect, yet. But what about the slogan: "Maple - unsafe at any evaluation"?

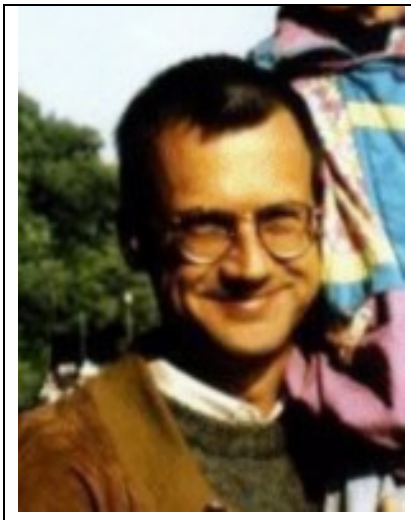


Read full story Dec 23, 2003 comp.soft-sys.math.maple
Peter Luschny, Re:Constant polynomial has multiple values

But studying the code it seems clear to me that the *real bug* is something different:

If this piece of code would have been written according to software standards of the year 2004, and not of the year 1990, and techniques and tools of today would have been used, such a bug would not appear.

But Maplesoft sells this piece of (obsolete) software as if it is state of the art. It certainly is not.



Read full story Dec 22, 2003 comp.soft-sys.math.maple
Peter Luschny, Constant polynomial has multiple values

E_n(x) = euler(n,x) is an Euler polynomial, the most simple of which is the constant polynomial n=0. E_0(x) = euler(0,x) = 1 for all x.

However, euler(0,1); -> -1 Release 5, IBM INTEL NT, Jun 16 1998

I could not imagine such a bug in Maple before this bug bit me. Any information how many 'versions' this bug survived?

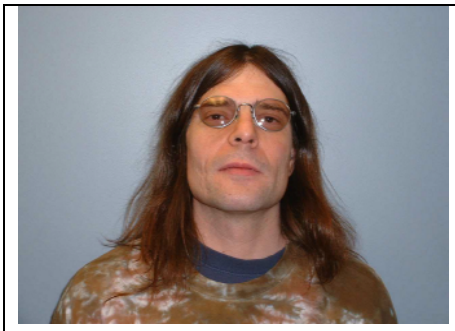
What can we expect of the integrity of Maple, if they cannot guarantee that a constant function assumes only one value? What will we see next? 1+1=0? Easy: 1 + euler(0,1) = 0.

Read full story

From: Vladimir Bondarenko (vb@cybertester.com)
Subject: euler(0,1) shows Maple bugs are really ubiquitous
Newsgroups: comp.soft-sys.math.maple
Date: 2003-12-22 14:14:36 PST

The recent catch by Peter Luschny is a splendid and fairly typical example of Maple mathematical correctness. I also believe it also shows why the Cyber Tester, LLC' massive computation effort directed to Maple bug identification is so important: for the first time, all of us will have a holistic eerie and grand tapestry of Maple bugs, NOT that you see today at http://maple.bug-list.org/ .

```
PL> euler(0,1);  # Maple 9.03: Sure, this must be equal to 1
    -1
```

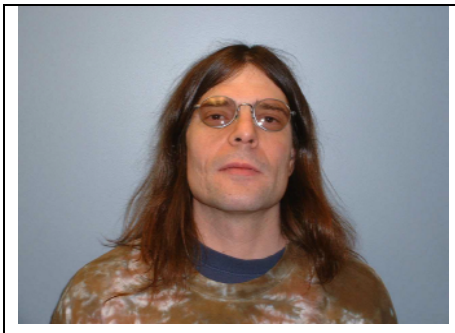


Read full story Dec 28, 2003 comp.soft-sys.math.maple

Carl DeVore, Re: euler(0,1) shows Maple bugs are really ubiquitous

How do you know that they (the [Maplesoft's] management) have seen the complaints?

They do not provide any indication that they read this news group.



Read full story Dec 28, 2003 comp.soft-sys.math.maple

Carl DeVore, Re:euler(0,1) shows Maple bugs are really ubiquitous

> If one wants to have a real effect on Maplesoft's management, I suggest typing a
> letter on real paper and sending it via real mail to the president of Maplesoft.

People often say that, but it makes no sense to me. The only effective ways to make organizations change are public criticism (boycotts, strikes, journalism, etc.), litigation, and military or police action. It is only the

	exceptional CEO that listens to the individual customer, and such CEOs are noteworthy enough that they write articles about that person in _Forbes_, _Inc._, etc.

Read full story May 3, 2000, sci.math.symbolic Krista <Krista@usa.com>, Re: Buggy Maple V R5.0 ?

I want to have my money back for this damn retarded program!
They charged me a huge sum of money for this s##t program!!

Read full story Feb 27, 2004, comp.soft-sys.math.maple
Homer J Fong <homersimpson22@hotmail.com>, Re: Maple 9.03 Now Available

I can't believe they released software that has such poor performance.
Shouldn't that have been spotted during development?

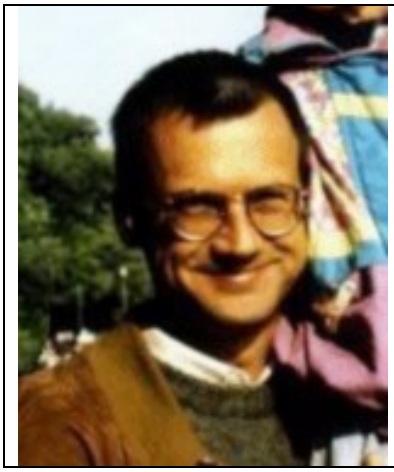
Read full story Dec 4, 2003, comp.soft-sys.math.maple
Ken Lin <maplemath@tp.edu.tw>, Re: Maple 9.03 Now Available

There are still some problems in Chinese font display in Maple v9.03. In fact, we "see" nothing but only a "-". I told the manager Ko since v9.00. Now you have v9.03, but the problems are still there. Is there someone can tell us why the Chinese fonts can be displayed correctly in "The Classic Worksheet Maple 9"(.mws) but not in "Standard Maple 9"(.mw)?

In Taiwan, we still use .mws (The Classic Worksheet Maple 9), .mw was useless in our Windows Chinese platform for now. If Waterloo MapleSoft can not promise the users a better and more steadier new version.

Please don't upgrade Maple so often just for some commercial considerations.

Ken Lin



Read full story Dec 6, 2003 comp.soft-sys.math.maple
Peter Luschny, Re: Maple 9.03 Now Available

> Maplesoft has released Maple 9.03 for download. [...]
> 9.03 also contains all updates found in 9.02 and 9.01. Existing users (9.00, 9.01, 9.02)
> can access the update from the Technical Support section of the Maplesoft Web site.
> An installation of 9.00, 9.01, or 9.02 is required for the update to function properly.

What about calling 9.00 Beta-1, 9.01 Beta-2, 9.02 ReleaseCandidate-1, 9.03 ReleaseCandidate-2?

Do you know how much time for installation, re-installation, re-re-installation etc. you are thieving from your customers?

	And: we are still waiting for the 'true' 9. release. Regards Peter

Read full story Jul 14, 1998 sci.math.symbolic
Simon Plouffe, Re: Big Bad Bug in Maple: ifactor

> binomial(2*k,k) time in second

The last one is binomial(4098,2049) a ~1000 digits number, it should be VERY easy to factor and take only a few milli-seconds + the time to parse the list of factors. In this case it takes over 8 minutes on a fast machine.

As you can see, it increases exponentially,
This is a bad implementation.

Simon Plouffe
plouffe@math.uqam.ca

Read full story Jul 14, 1998 sci.math.symbolic
Simon Plouffe, Re: Big Bad Bug in Maple: ifactor

They should hire professional programmers and mathematicians at Maple instead of relying on the 'graduate student algorithm' to improve maple!.

For those who do not know what is that algorithm : You put a graduate student in a locked room and you feed that person from time to time by sliding a sandwich in a little trap door, you just wait that the algorithm is done.

It is cheap and it works most of the time.

Simon Plouffe
plouffe@math.uqam.ca

Read full story

From: Homer J. Fong (homersimpson22@hotmail.com)
Subject: Re: Maple 9 and Mac questions
Newsgroups: comp.soft-sys.math.maple
Date: 2004-02-27 21:10:04 PST

We asked every one of our Math and Physics faculty to compose a message with their Maple performance complaints, and every one of the let them have it with both barrels, then I forwarded it off to their support folks.

They wrote back saying they were aware of the performance problems and were "working on it." Gee, shouldn't they have done that before they released it?

How on Earth they could possibly have let version 9 out the door with such horrible performance...what were they thinking?

Read full story Wed, 21 Jul 2004 comp.soft-sys.math.maple
John Harper, asympt(hypergeom(...)) problem

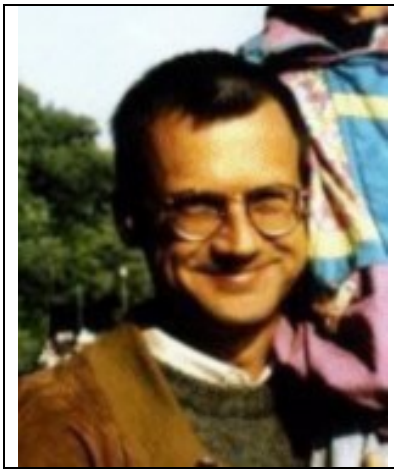
Five years ago I complained to Waterloo Maple Inc. that Maple V.5 couldn't do asymptotic expansions of hypergeometric functions, though V.4 could if they reduced to more elementary functions.

This problem has still not been fixed!

Read full story Wed, 21 Jul 2004 comp.soft-sys.math.maple
John Harper, asympt(hypergeom(...)) problem

Asymptotic expansions of pFq and some more general functions have of course long been known (Wright, E.M., Proc.Lond.Math.Soc. 46, 389-408, 1940). They need the sort of complicated algebra that I had thought Maple was designed for.

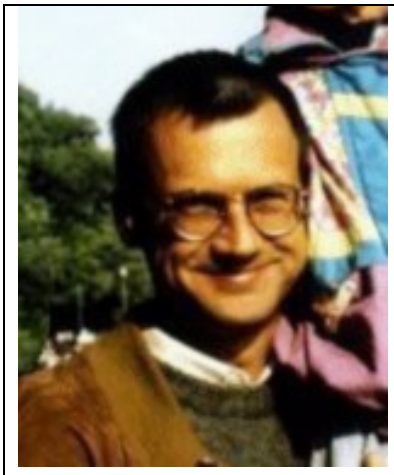
In the example below the hypergeometric function can be simplified, though not by **asympt**, but Maple 9.5 fails even when helped by a simplify command to give an O(something) error estimate.



Read full story Dec 7, 2003 comp.soft-sys.math.maple
Peter Luschny, Re: Maple 9.03 Now Available

Of course they should not sell software which is at that level of maturity.

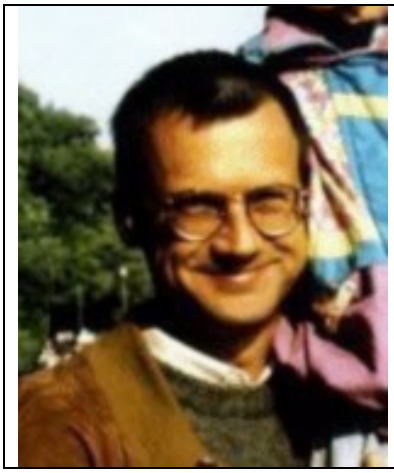
These are quite common terms to describe /internal/ stages of development.



Read full story Dec 7, 2003 comp.soft-sys.math.maple
Peter Luschny, Re: Maple 9.03 Now Available

Their work is hard and they do deserve to be paid well for their rent, kids, cars and whatsoever other amusements - if they do their work in a satisfactorily manner.

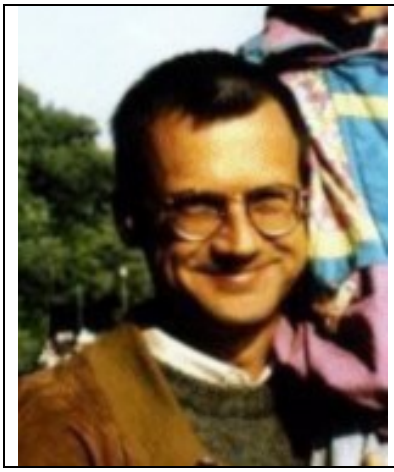
The soap opera they are showing right now with the releases of 9.00, 9.01, 9.02, 9.03 within a couple of month does /not/ indicate this.



Read full story Dec 7, 2003 comp.soft-sys.math.maple
Peter Luschny, Re: Maple 9.03 Now Available

I do not complain about minor inconveniences. I have learned to live with this.

I just don't want to buy big, substantial bugs which hinder the use of basic features.

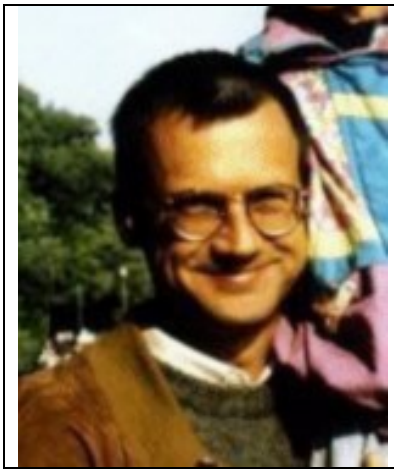


Read full story Dec 7, 2003 comp.soft-sys.math.maple
Peter Luschny, Re: Maple 9.03 Now Available

Did you watch Maplesoft over the years?

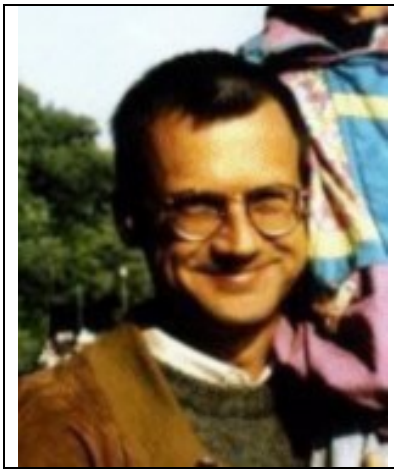
The price went up,
their hype went up,
their arrogance went up -

and the quality went down.



Read full story Dec 7, 2003 comp.soft-sys.math.maple
Peter Luschny, Re: Maple 9.03 Now Available

How do you expect them to stay in business if they sell a product which *is* Maple Release xx.beta-1?



Read full story Dec 7, 2003 comp.soft-sys.math.maple
Peter Luschny, Re: Maple 9.03 Now Available

Did you read what was said about the Java-interface in this group?

Or about the usefulness of Release 9 for the Mac?

Read full story sci.math.symbolic Apr 19, 2002, Jerry W. Lewis, Info on Maple 7 Factorial Bug?

Maplesoft has acknowledged this as a known bug, but has thus far (despite repeated requests since Monday) explicitly refused to give any information about its nature or scope to allow me to confidently work around it.

Even more disturbing is the fact that the return value depends on more than its argument. That looks suspiciously like it is caused by a memory management problem. If it is memory management, then without more information, I worry that it could resurface anywhere.

Jerry

Read full story

> Please, does anyone kwon when the new release of Maple V
> (i.e. R4) will be available for UNIX systems?

```
2 or 3 months ago I wrote an e-mail to Waterloo asking the above. I
didn't received any answer.

I don't know, why they don't want to answer.

Juergen

--
Juergen Bachteler   Institut fuer Theoretische und Angewandte Physik
                    Pfaffenwaldring 57    D 70569 Stuttgart
                    +49 711 / 685 - 5263  (FAX: 5271)
                    juergen.bachteler@itap.physik.uni-stuttgart.de
PGP key by finger available
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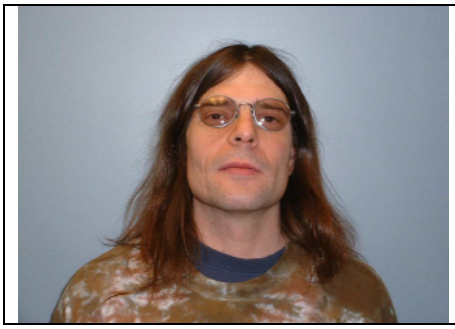


Read full story Jun 19, 2001 MUG
Carl DeVore, Re: A problem in Maple 6

This brings up a more general and severe point. There needs to be a more mechanized way of checking these things, of finding these bugs. This is essential if Maple is ever going to be used for some critical, real-time, life-or-death application -- for example, traffic control.

Read full story Jun 22, 2001 MUG Humberto Jose Bortolossi, Re: A problem in Maple 6

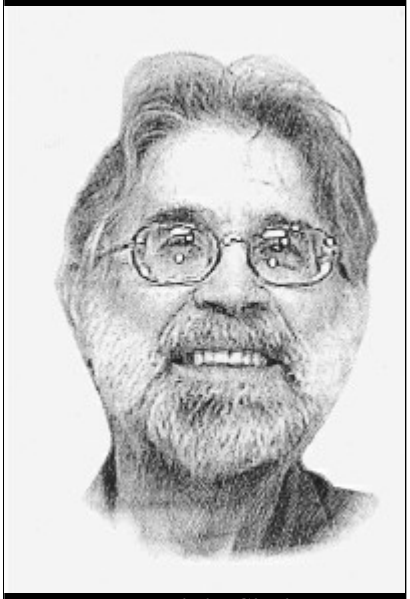
What about a free patch for Maple 6.x owners? Always we have to upgrade (and pay more money) to get bugs fixed???

Read full story Jun 22, 2001 MUG
Robert Israel, Re: A problem in Maple 6

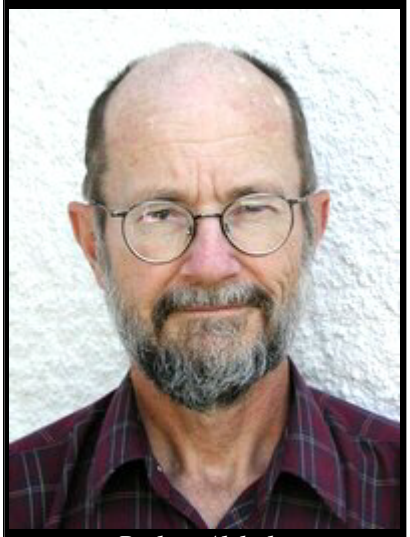
> Carl DeVore wrote: This brings up a more general and severe point. ...

I really hope nobody ever uses Maple for critical, life-or-death applications. It's much too complicated to ever be sure that there are no more bugs, even if much more effort was put into searching for and correcting them. That type of application needs a much different style of programming. Sufficiently complicated software may be impossible to certify as bug-free anyway - cf. the debate some years ago in connection with the "Star Wars" missile defense system.

Robert Israel



W. Edwin Clark



Preben Alsholm

Carl DeVore

William C. Bauldry

Fr. Mike May

	Read full story Bill Page **From:** Bill Page <bill.page1@s...> **Date:** Tue Oct 1, 2002 2:21 pm **Subject:** Re: [maple8] Bug tracking system I am in complete agreement with some of the other sentiments expressed here that unless Maplesoft takes some bold and significant steps towards become more open and accountable for the quality of the product, Maple is in grave danger of losing many long term loyal customers. Under such circumstances, I find it hard to believe that sales to new users and students will be sufficient to support the company.

http://mathforum.org/epigone/sci.math.symbolic/cloutwulplo/58u8e3$hha@rebecca.albany.edu

Re: Maple V R4 for UNIX platforms, when? by Herb Brown

The University at Albany
Date: 14 Dec 1996 13:00:51 GMT

I also wrote and explained how important it is to academic institutions that use the unix version to have the latest release made available to them by the middle of the summer so that it can be installed in time for the beginning of the fall semester which usually begins the academic year.

It is much too disruptive to both students and faculty to install a new version after the fall semester begins.

All classes that have been using the older version will become confused by the appearance of the newer version.

I also never received a reply to my message.

The result of not having the newer release 4 available for our unix clusters is that our entire academic

institution now lags behind by one year.

This is a terrible situation and I would hope that Waterloo Maple would correct this situation.

Herb

--
Herbert I Brown hibrown@math.albany.edu (518) 442-4640
Math Dept, The Univ at Albany, Albany, NY 12222

Read full story

From: Herb Brown (hibrown@csc.albany.edu)
Subject: Re: Maple V R4 for UNIX platforms, when?
Newsgroups: sci.math.symbolic
Date: 1996/12/17
Dec 17, 1996 13:30:01 GMT

>Do they say, which Christmas? (1997 ?)
>
>> Mind you, they said the release was imminent in May, July and November...
>> Very frustrating to say the least. Ian.

>And very frustrating, that they don't answer. For me, maple for unix
>is dead.
>
>Juergen
>
>--
>Juergen Bachteler Institut fuer Theoretische und Angewandte Physik
> Pfaffenwaldring 57 D 70569 Stuttgart
> +49 711 / 685 - 5263 (FAX: 5271)
> juergen.bachteler@itap.physik.uni-stuttgart.de
>PGP key by finger available

Yes, I agree. It is also "dead" as far as the current academic
year is concerned at The University at Albany. We cannot in
good conscience install a new release in the middle of the
academic year. I wish Waterloo would pay more attention to
this. After all, Maple did originate on an academic campus so
the concept should not be new to the current developers. Thus,
our campus site license is once again lagging ONE year behind.
This is slowly becoming an intolerable situation.

Herb

--
Herbert I Brown hibrown@math.albany.edu (518) 442-4640
Math Dept, The Univ at Albany, Albany, NY 12222

http://mathforum.org/epigone/sci.math.symbolic/cloutwulplo/pwg216vksl.fsf@gaston.ethz.ch

Re: Maple V R4 for UNIX platforms, when?

ct: Re: Maple V R4 for UNIX platforms, when?
r: Andreas Eggenschwiler <res@gaston.ethz.ch>
Organization: Swiss Federal Institute of Technology (ETHZ)
Date: 16 Dec 1996 10:35:38 +0000

> ...
> new release, but I'm not sure, that we want to buy it any more ...

We start to consider switching to MuPad here...

http://mathforum.org/epigone/sci.math.symbolic/cloutwulplo/32B34AED.221D860E@lehigh.edu

Subject: Re: Maple V R4 for UNIX platforms, when?
Author: David L. Johnson <dlj0@lehigh.edu>
Organization: Lehigh University
Date: Sat, 14 Dec 1996 19:48:45 -0500

Herb Brown wrote:

> I also wrote and explained how important it is to academic
> institutions that use the unix version to have the latest
> release made available to them by the middle of the summer
> so that it can be installed in time for the beginning of the
> fall semester which usually begins the academic year. It is
> much too disruptive to both students and faculty to install
> a new version after the fall semester begins. All classes
> that have been using the older version will become confused
> by the appearance of the newer version. I also never received
> a reply to my message. The result of not having the newer
> release 4 available for our unix clusters is that our entire
> academic institution now lags behind by one year. This is a
> terrible situation and I would hope that Waterloo Maple would
> correct this situation.

Even worse, the computer center at my university decided over teh Summer
to install R4 on all the student LANS (without mentioning it to me).
But of course the workstation sites still have R3, and the worksheets
are not compatible... It has made for a fun semester, and, frankly, I'd
just like to know when this particular nightmare will end.

--

David L. Johnson
Department of Mathematics
Lehigh University
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Bethlehem, PA 18015-3174

dlj0@lehigh.edu, dlj0@netaxs.com
http://www.lehigh.edu/~dlj0/dlj0.html

(610) 758-3759

Multidimensional Master
Ian Stewart

[by Tom Georgoulias]

Dr Ian Stewart, Numerical Analyst, University of Bristol Computing Services. E-mail: I.Stewart@bris.ac.uk Voice: +44 117 928 7866	http://mathforum.org/epigone/sci.math.symbolic/cloutwulplo/E2ICE4.Bx5@fsa.bris.ac.uk Re: Maple V R4 for UNIX platforms, when? by DB. Andre We are also desparately awaiting release 4 (we have SGI machines and Maple Vr3 will not run on Irix6.2 so we can't upgrade the OS) for some time. The latest info I have from our UK suppliers is: "The good news is that Waterloo are confident of shipping R4 for SGI, SUN Solaris, RS6000, DEC Alpha AND HP before Christmas." Mind you, they said the release was imminent in May, July and November... Very frustrating to say the least. Ian. --- Dr Ian Stewart, Numerical Analyst, University of Bristol Computing Services. E-mail: I.Stewart@bris.ac.uk Voice: +44 117 928 7866

Read full story Dec 28, 2003 comp.soft-sys.math.maple
Harald Pleym, Re: euler(0,1) shows Maple bugs are really ubiquitous

The question is how long it is possible to use the Classic interface. What I have been told is: "Maplesoft will keep Classic around for at least another release and after that for as long as they need to". And no one knows what they intend to do. And as far as I know Maplesoft will only fix the most serious bugs in the Classic version of Maple 9. And there is a lot of bugs in the Classic version.

They will only give priority to the new Java GUI, which I think will give Maplesoft problems for years from now.

http://groups.google.com/groups?hl=en&lr=&ie=UTF-8&oe=UTF-8&safe=off&selm=b098cc38.0312281048.2a67ee92@posting.google.com

2003-12-28

Re: euler(0,1) shows Maple bugs are really ubiquitous

Maple 9.03 is still useless for me and my students, mainly because of still serious problems to get hyperlinks in Maple 8 worksheets to work when loaded with Maple 9 Java GUI. And in addition we have to wait for a long time
to get worksheets to pop up. All I have talked to have no confident to Java as a GUI. It seems to me that MapleSoft have a very long time to go within they can provide us with a computational tool is it poosible to live with at the same level as for instance Mathematica and Matlab.

http://groups.google.com/groups?hl=en&lr=&ie=UTF-8&oe=UTF-8&safe=off&selm=b098cc38.0312281048.2a67ee92@posting.google.com

2003-12-28

Re: euler(0,1) shows Maple bugs are really ubiquitous

<FONT color=#660066>> You do not have
> to ever use the new interface unless you want to use some of the new
> GUI features.</FONT>

It is not at all a question of "want to use ..". We are really
prevented from using the new GUI due to all the serious bugs already
mentioned.

http://lapcs.univ-lyon1.fr/~nthiery/CalculFormelLibre/report/

Richard Kreckel:

Isn't Maple a sloopy/bad system? We must take in count sloopyness.

http://lapcs.univ-lyon1.fr/~nthiery/CalculFormelLibre/report/

Success of Mathematica/Maple has not something to do with sloopyness, but with the price of Axiom. Axiom was too expensive, not targeted at commercial usage, needed support.

http://lapcs.univ-lyon1.fr/~nthiery/CalculFormelLibre/report/

Joris van der Hoeven:

It is not true that mathematical rigor is contradictory with easiness to use.

One can imagine two levels: one theory-based development-level, and one exported level with a nice user-interface

	http://groups.google.com/groups?hl=en&lr=&ie=UTF-

	8&newwindow=1&frame=right&th=3c9788b2a4712ab8&seekm=07022002104145279 7%25edgar%40math.ohio-state.edu Where can I find actual bugs list of the Maple7?

Read full story Oct 16, 2003 comp.soft-sys.math.maple Gennady V. Kovalev, Re: Why it's doing so?

I don't believe the situation with Maple's bugs will be better soon. It seems that Maplesoft isn't interested to 'polish' this product.

Read full story

From: Marc Murison (murison@yahoo.com)
Subject: Re: New Interface on Maple 9
Newsgroups: comp.soft-sys.math.maple
Date: 2003-09-16 11:27:36 PST

```
> Worksheets saved in one interface should be readable in the
> other interface.

That's the way it *should* be, but unfortunately it's not the case here, in certain
circumstances.  If you have a Maple 8 worksheet where the input statements are
formatted in "Standard Math", it is hashed up and completely unusable in Maple 9 Java.
Maple 9 "classic" reads and interprets all Maple 8 worksheet just fine, fortunately.
Oh well, so much for the fancy new Java interface for those of us who work in
"Standard Math" mode.

To compound matters, Maple tech support refuses to acknowledge emails regarding this
mess.
```

Shame on Maplesoft for inflicting this early beta version on us.

Read full story

From: Jacques M. TORRE (jtorre@mac.com)
Subject: Maple 9 for Mac OSX : a shame !
Newsgroups: comp.soft-sys.math.maple View: Complete Thread (5 articles)
Date: 2003-09-14 02:16:33 PST Original Format

```
I have just installed Maple 9 on my PowerBook G4 (667 Mhz, 1Go, Mac
OSX 10.2.6).
In the use, I meet the following crippling problems :

1) The recovery of my former files (Maple 7) is practically impossible
:
- All the accented letters (text input) disappeared,
```

```
- Fonts are not recognized,
- Various used styles are not recognized,
- The management of left single quotes (standard math) is erratic
(they disappear when recording).

2) Printing is catastrophic :
- Setting parameters are ineffective ("scale" in particular),
- The space between the printed lines is much bigger than that
appearing to the screen,
- characters in italic (standard math) are printed straight ahead,
- "Print preview" is of an unacceptable quality.

3) Miscellaneous
- A double-click on a .mw file opens Maple 9 with a blank page, but
not the concerned file.
- An excessive slowness when opening Maple 9 or a .mw file.

To summarize :
On Macintosh OSX platforms, Maple 9 is unusable in the current
release.
Former files are irretrievable (text input and standard math).
Paper publishing is unusable.
Maplesoft is fucking around with Macintosh users.

The version 9.0.1 does not bring any improvement.
In this company, has anybody checked Maple 9 on MacOSX platform ?
Probably never, and this is a shame.

On the other hand, I know that there is several persons in this
company to cash my check !
   -
```

Read full story

```
From: rusin@shuksan.math.niu.edu (Dave Rusin)
Subject: Another Maple integration gaffe
Date: 10 Mar 1999 09:29:12 GMT
Newsgroups: sci.math.symbolic
```

I had always wanted my calculus students to have the same skills as Maple; unfortunately I seem to have gotten my wish

Read full story

[MUG] Waterloo Maple, Inc. testing standards?
>> From: Vladimir Bondarenko "vvb"

Hello,

What software testing standard(s) Waterloo Maple, Inc. uses?

Any directions or hints are really appreciated.

Vladimir Bondarenko
Applied mathematician

Vladimir Bondarenko
Thu, 30 May 2002 07:16:58 +0400

> "Maplesoft is fucking around with Macintosh users."

and finally, a yet another Maple expert's opinion:

0. ~~Использовать особую, изысканную подложку для Main Results — SW chocolate picture as he sits on tapestry.~~

1. Использовать привлекательную подложку для Maple Bugs Example (например, как у SW в ноутбуках)

2. Создать превосходную, изысканную но строгую первую страницу.

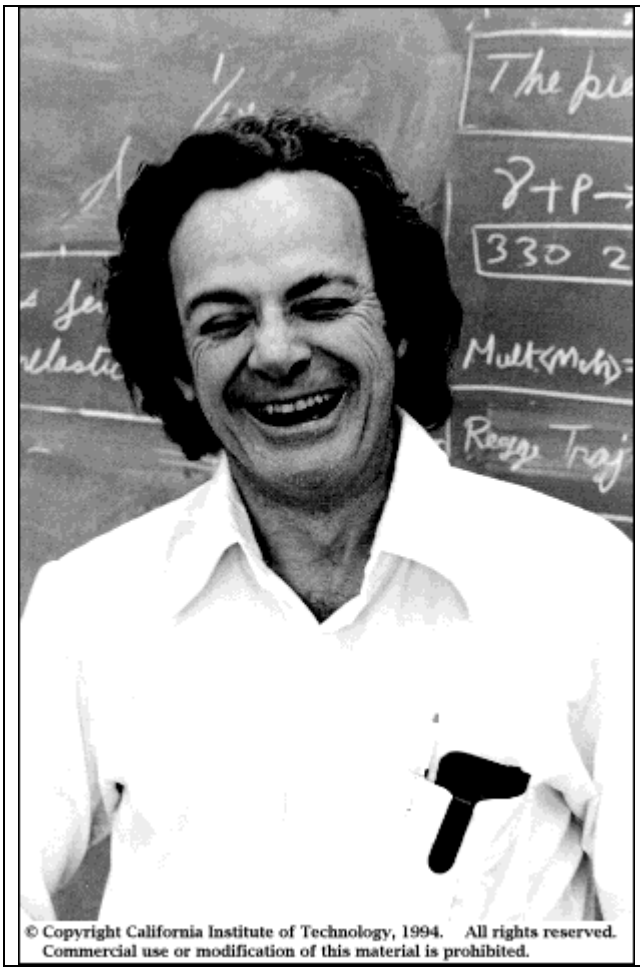
3. Добаить юмористические рисунки? Все великие математики схватились за голову (пародия на Maplesoft плакат)

4. Колонтитулы четкие, но не наезжающие на текст.
5. Нумерация – корректная
6. количество багов в Maple 5555 – все 4 цифры видны
7. Надпись сравнении графиков
8. Структурированное оглавление
9. Перескок на ссылки внутри докукмента
10. URL жолжны работать в pdf
11. Список литературы.
12. Свидетелей вставить и пересортировать

13. *Will you being relatively not drunk start putting onto paper the number ADD ?*
14. NICE ICONS FOR TYPES OF MAPLE BUGS

5. ~~Убрать колонтитул с 1-й страницы!!!~~

6.



PITA, Pain In the Ass

PITA = People for the Intelligent Treatment of Animals
PITA = Pacific International Trapshooting Association

Amor magis cognitivus quam Cognitio

http://www.andersen.sdu.dk/vaerk/hersholt/TheEmperorsNewClothes_e.html

"Magnificent," said the two officials already duped. "Just look, Your Majesty, what colors! What a design!"

> "But he hasn't got anything on," a little child said.
>
> "Did you ever hear such innocent prattle?" said its father. And one person whispered to another what the child had said, "He hasn't anything on. A child says he hasn't anything on."
>
> "But he hasn't got anything on!" the whole town cried out at last.

The Emperor shivered, for he suspected they were right. But he thought, "This procession has got to go on." So he walked more proudly than ever, as his noblemen held high the train that wasn't there at all.

http://aladjev.newmail.ru/DownLoad/Maple_Lib.htm

При достаточно частом объявлении о новой продукции Waterloo **Maple**, тем временем, уделяет недостаточно внимания устранению имеющихся **ошибок** и дефектов, переходящих от релиза к релизу
19. **Aladjev** V. Computer Algebra System **Maple**: A New Software Library // Intern.

Тем временем, наш эксплуатационный опыт в течение 1997 - 2004 г. г. с пакетом **Maple** релизов **4 - 9** позволил нам не только оценить его преимущества по сравнению с другими подобными пакетами, но также выявил ряд ошибок и недостатков, устраненных нами. Кроме того, пакет **Maple** не поддерживал ряд достаточно важных процедур обработки информации, алгебраических и численных вычислений, включая средства доступа к файлам данных. Ввиду сказанного, в процессе работы с пакетом **Maple** мы создали достаточно много эффективного программного обеспечения **(процедуры** и **программные модули**), целым рядом характеристик расширяющих базовые и по выбору возможности пакета. Данное программное обеспечение было организовано в виде **Библиотеки**, которая является структурно подобной главной библиотеке **Maple** и обеспечена развитой **Help**-системой, аналогичной подобной системе пакета **Maple** и органично с ней связанной. Описание данной **Библиотеки** представлено ниже.

Более того, программные средства, составляющие **Библиотеку,** в своем большинстве имеют дело именно с базовой средой **Maple**, что пролонгирует их актуальность как на текущие релизы, начиная с **шестого**, так и на последующие релизы пакета. В этой связи здесь уместно обратить внимание на один весьма существенный момент. При достаточно частом объявлении о новой продукции **Waterloo Maple**, тем временем, уделяет недостаточно внимания устранению имеющихся ошибок и дефектов, переходящих от релиза к релизу. Некоторые из них являются достаточно существенными. Мы отмечали данное обстоятельство в наших книгах неоднократно, этому вопросу посвящен целый ряд замечаний и членов **MUG**. Более того, расширению инструментальных средств основной среды пакета также уделяется недостаточное внимание, что особенно заметно в режиме продвинутого программирования в его среде. Объявленная **Библиотека** содержит расширение инструментальных средств, прежде всего, базовой среды пакета, что пролонгирует их актуальность и на последующие релизы пакета, а также весьма существенно упрощает программирование целого ряда задач в его среде и обеспечивает более высокий уровень совместимости релизов **6, 7, 8** и недавно появившегося на рынке **9**-го релиза пакета. Обнаруженная нами несовместимость пакета как на уровне релизов, так и на уровне базовых платформ – **Windows 98SE** и ниже, с одной стороны, и **Windows ME/2000/XP** и выше, с другой стороны, потребовала решения проблемы совместимости для средств **Библиотеки**.

http://portal.acm.org/citation.cfm?id=244141

No free lunch for cross-validation

Neural Computation archive
Volume 8 , Issue 7 (October 1996) table of contents
Pages: 1421 - 1426
Year of Publication: 1996
ISSN:0899-7667

Authors

Huaiyu Zhu
Richard Rohwer

The following paper has been submitted to Neural Computation:

ftp://ftp.santafe.edu/pub/zhuh/anti.ps

http://www.ph.tn.tudelft.nl/PRInfo/reports/msg00095.html

Paper: Less predictable than random ...

- *Subject*: Paper: Less predictable than random ...
- *From*: Huaiyu Zhu <zhuh@santafe.edu>
- *Date*: Mon, 04 Aug 1997 14:08:21 -0600
- *Organization*: Santa Fe Institute
- *Sender*: zhuh@santafe.edu

Anti-Predictable Sequences: Harder to Predict Than A Random Sequence

Huaiyu Zhu <zhuh@santafe.edu>
Santa Fe Institute, 1399 Hyde Park Rd, Santa Fe, NM 87501, USA

Wolfgang Kinzel <kinzel@physik.uni-wuerzburg.de>
Santa Fe Institute, 1399 Hyde Park Rd, Santa Fe, NM 87501, USA
Institut f\"ur Theoretische Physik,
Universit\"at, D-97074 W\"urzburg, Germany

ABSTRACT

For any discrete state sequence prediction algorithm A it is always possible, using an algorithm B no more complicated than A, to generate a sequence for which A's prediction is always wrong.

For any prediction algorithm A and sequence x, there exists a sequence y no more complicated than x, such that if A performs better than random on x then it will perform worse than random on y by the same margin.

An example of a simple neural network predicting a bit-sequence is used to illustrate this very general but not widely recognized phenomena.

This implies that any predictor with good performance must rely on some (usually implicitly) assumed prior distributions of the problem.

--
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ftp://ftp.santafe.edu/pub/zhuh/

http://www.literateprogramming.com/best/meanyou.html

What does literate programming mean to you?

From: **Huaiyu Zhu**
Date: 22 Sep 1993

Freeland Abbott writes: You forgot the guarantee. "What guarantee?" you ask... I mean the guarantee that the information is up-to-date and therefore likely to be correct; it's the difficultly of providing that which makes the job hard.

The difficulty arises from the fact that computers and humans read completely different parts of a literate program. Following are some ideas of how this can be avoided. At present we have 'pure programming languages' like C, 'pure text formatting languages' like TeX. Their combination is the so-called literate programs. However, we also have many computer algebra software, (also called symbolic computation). If they are added to the programs, the results can be far more robust against change. Here's a sample C function.

```
---------------
void f(float a)
{
                    //requires: a>0
    float b, c, d;
    b = sqrt(a);    //guarantees: b>0
    scanf("%f", c); //requires: c>0
    d = c+1/c;      //guarantees: d>2
                    //invariant: a
}
--------------
This is what an "ideal compiler" should say:

assertion at line 3 (a>0) passed to linker.
assertion at line 6 (c>0) changed to run time checking.
assertion at line 7 (d>2) not guaranteed. Best possible: d>=2.
_______________
```

In this way, the compiler reads the program and assertions, and make sure that they agree with each other. The typesetting mechanism makes the assertions part of the text, so that humans can read them easily. Of cause this idea comes from the programming language Eiffel, but what I would like is a full symbolic computation mechanism. It will be really great if there is a universal mechanism by which programming language, symbolic computation software, and text formatting software can be combined, even if they are designed without regard to each other. Sounds like a dream?

No Free Lunch for Cross-Validation

http://www.clairvoyancecorp.com/Research/Workshops/AAAI-EAAT-2004/Papers.html

Politeness and Summarization: an Exploratory Study
Certainty Categorization Model
Analyzing Appraisal Automatically
Reading Between the Lines: Attitudinal expression in text

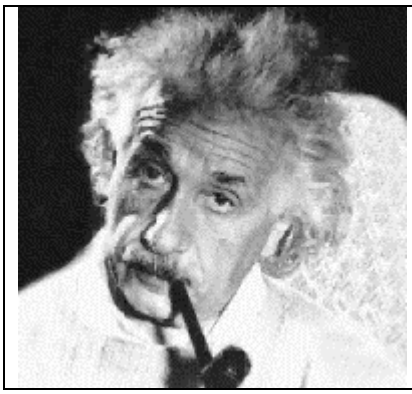
Discerning Emotions in Texts
Automatic Critiquing of Novices' Scientic Writing Using Argumentative Zoning
Attributions
Mining Multilingual Opinions through Classification and Translation
Discovering Subjectivity Using Multi-document Summaries
Automatic Extraction of Opinion Propositions and their Holders

Under the risk of ... Speaking figuratively, the evolution of Maple during 1998-2002 reminds a phase transition of the second kind. Maple 8 was a kind of the point where

"software+quality+of+Maple"

"software+quality+of+Maple+bugs"

ADD Einstein – I did not know that this is impossible…

	I did not know that this is impossible

"Use Fluid Properties"
"Use New Fluid Name"
"Use Reset"

Use Case "Save".

Use Case "Delete TAG info"

Use Case "Use Applicator SI"
Use Case "Use Help"

Use Case "Use Principles"
Use Case "Use Formula"
Use Case "Use Navigator"

6. User-Level Requirements.

Use Case is a modeling technique used to describe what the system would do. The primary components of the use case model are *use cases*, *actors*, and the *system* modeled. The boundaries of the system are defined by the functionality that is handled by the system. The functionality is

represented by a number of use cases, and each use case specifies a complete functionality. When the functionality is complete, the use case must handle the entire function, from its initiation until it has performed the requested functionality.

Here we are using the notation and symbols of the Unified Modeling Language.

User Requirements -- Endress & Hauser Applicator Sunba **euhapp_ureq.doc**

```
From: Jacques Carette <Jacques.Carette@inria.fr>
     Subject: Re: Interesting Series Results

>      Subject: Re: Interesting Series Results
>      From: leif@hamilton.nhh.no
>
> This result supports Frederick W. Chapman's first suggestion:
>
> "There is a sense in which this is not an error: the Caesaro Means of the
> series do in fact converge, and to the value -1/2.  The Caesaro Means are a
> summability method for infinite series; to compute the n-th Caesaro Mean,
> simply compute the arithmetic mean of the first n partial sums of the
> original series....."

In fact, Maple uses Levin's u transform for computing infinite sums, and
thus can sum up some divergent series whose Caesaro means converges.

The code, in `evalf/sum1` and `evalf/sum1/levinu` is not absolutely
clear but is instructive.

Jacques Carette
```

chain gang — амер. каторжники в кандалах, скованные одной цепью

chain-gang ['tSeIngxN] n
1.группа каторжников в кандалах, скованных общей цепью
2.воен. жарг. «кандальники», технический состав ВВС, технари

ability to motivation many, trump cards, pitfalls

incremental results

survival through time

measuring success, how to control allocation of resources?

Long term vision: the CA community is attempting to define and develop a notation for math which is effective. If I can take Barry Trager's thesis on integration and integrate it, it's written down in a way which is usable by many people, and will still be there in 15 years.

Almost all the important question, except the cost. Cost for the researchers community, but also cost of *not* having it. What would be the cost for not having libraries, a review system? The main reason I did not follow an academic carreer is that I missed a free CAS (lack of cooperation in the free software community). It's only a question of time that a free CAS will exist, with or without this community.

scalability: to plug-in as many systems as you want.

Transitivity: if you have a good interface between A and B, and a good one between B and C, then you get a good one between A and C

Discussion about interoperability (between components, good plotting interface)

http://www.maplesoft.com/

Maplesoft is a world leader in mathematical and analytical software.

<meta name="description" content="Maplesoft is a world leader in mathematical and analytical software. The Maple system embodies advanced technology such as symbolic computation, infinite precision numerics, innovative Web connectivity and a powerful 4GL language for solving a wide range of mathematical problems encountered in modeling and simulation.">

http://www.maplesoft.com/

Maple 9.5, the essential productivity tool for every technical professional.

Maplesoft> Maple 9 - the standard in interactive math software

http://www.scg.uwaterloo.ca/~maple_gr/Digests/Digest02.05

Maple,
automated testing system,
bug, bug list,
severity,
symbolic computation,
bug life cycle,
software development,

quality assurance,
quality control,
validation,
verification,
overheads reduction

Herbert I Brown hibrown@math.albany.edu (518) 442-4640
Math Dept, The Univ at Albany, Albany, NY 12222

Herbert I. Brown, Ph.D., Rutgers University

Functional analysis with applications to summability, FK topologies, algebras of bounded linear operators on certain sequence spaces.

NON-UNIFORMITY

http://www.consciouschoice.com/environs/riskybusiness1401.html

The Vagaries of Expert Opinion

In the wake of most major accidents it is usually easy to find embarrassing examples of experts who predicted beforehand that such an event could never, ever occur. "I cannot imagine any condition which would cause a ship to founder.... Modern shipbuilding has gone beyond that," said Edward J. Smith, captain of the Titanic. A year before the nuclear meltdown at Chernobyl, a Soviet deputy minister of the power industry announced that Soviet engineers were confident that you'd have to wait 100,000 years before the Chernobyl reactor had a serious accident. Shortly before the explosion of the Challenger space shuttle, Bryan O'Connor, nasa's Washington-based director of the shuttle program, recalls that he "asked someone what the probability risk assessment was for the loss of a shuttle. I was told it was one in ten thousand."

Telecommunications Dictionary (C) Copyright 1991 R. Scott Perry
Version 1.10 Last Update: 8/22/91

"What is this, why, and who is this guy?"

I feel that this dictionary fills a major void. In my years of using BBS's, I have never seen such a dictionary. The closest thing I've seen was a text file that had about 40 words listed. These words included "RAM" "ROM" "Microcomputer" "Telex" and a bunch of other words that aren't really that important to understand telecommunications. I've seen some books about telecommunications in bookstores, but they tend to be expensive ($15-$49), and I don't recall seeing any dictionaries of telecommunications terms. Many terms are easy to confuse, and it can be very difficult to find definitions for these terms. I have seen terms used incorrectly in advertisements by modem manufacturers and in major magazine articles. I hope that this dictionary can be used as a good source of reference for confusing terms.

Why do I feel qualified to write a dictionary such as this? I bought my

first modem almost 6 years ago, and have been using computers for twice as long. Not only have I used many different computers and modems, I have seen the days where 1200bps BBS's were rare, and most people had 300bps modems. And, for about a year I ran my own BBS, which was quite successful at the time. While I only had about 150K of storage for messages and files, I was able to get over 500 users in that year. I have also gathered, read, and searched through dozens of text files, program documentation, and magazines, just to help define words and find new words for this dictionary. I have also spoken to representatives of major companies to help find out the truth behind the terms.

NOTES

Note 1: It was difficult to decide what words to include, and what words not to include. I tried to include every term relating to computer telecommunications that the average user needs to know, or might come across and be curious about. Some words are easily found in manuals for modems (such as PSK) but are hard to find definitions for. I tried to include as many of these as possible.

Note 2: Since there are so many words defined here, and many of them are complex and easily misunderstood, I wouldn't be surprised if there are a couple errors of some sort. I tried to be as careful as I could, but it is possible that there may be some mistakes. If you notice any mistakes, or have suggestions of words to add (or take out), feel free to write to me. I'll correct any mistakes in future versions.

MAKING COPIES OF THIS DICTIONARY

Remember, this is not public domain, but it's not shareware either. It is copyrighted. All I'm saying is that you can't change it. I have spent countless hours searching through information, making phone calls, compiling the words, figuring out what some of the words REALLY mean, and defining the words. You MAY freely make copies (as a computer file, printed, or in any other manner) for anyone you know, just so long as you do not charge money for it.

Any BBS may have this dictionary available for downloading, on the condition that users do not have to pay money in order to receive it.

In the case of DISTRIBUTORS who sell public domain and shareware type programs for a nominal fee, I grant you permission to distribute this dictionary given 2 conditions: [1] You send me a notice of some sort notifying me that you are going to be distributing this dictionary, and [2] you do not modify the file in any way. Send the notice to the address given below.

If you SELL any products (such as communications programs or modems), and wish to distribute this dictionary with your product(s), you MUST get my permission first. In most cases, if your product is legitimate, I would expect to grant permission. Send requests to the address listed below.

If you wish to QUOTE this dictionary in any media, such as in an article for a computer magazine, you must get my permission first (the address is listed

below). Again, I would expect to grant permission. Non-profit computer groups don't have to get my permission, as long as proper credit is listed.

PAYMENT?

If you felt this dictionary was very USEFUL, and you think that you would have paid money for it if it was in book form, I'd appreciate any donation. You are in no way obligated to do so, but if you found this dictionary very useful, and you can afford to part with a couple bucks, it would make me feel great. I'd recommend $5, but anything is fine. If you don't feel you can afford anything, but felt the dictionary was useful, a note of praise would make me feel good too. Any donations will be used towards setting up a support BBS for this telecommunications dictionary.

"How do I reach the author?"

Send any comments/suggestions/donations/notices/etc. to:

R. Scott Perry 178 Morton Street Newton Centre, MA 02159

Hopefully, there will soon be a BBS to call to get the latest version of the Telecommunications Dictionary, as well as to use as an easy way to contact me.

I hope you enjoy this dictionary!

RPF: I won the prize for shoving a great problem under the carpet

Holiday of Crazy Mathematician is in full riot…

While Laurent eats sushi meditatively (and rinses it down with little but numerous sakй cups ?!) let's continue our tour.

all-or-nothing perfectionist — человек, не мирящийся ни с какими недочётами, недоделками и т. п.

perfectionist [pq'fekS(q)nIst] n
1.взыскательный, добивающийся во всём совершенства человек; склонный к педантизму человек
2.сторонник доктрины (морального) усовершенствования
3.неодобр. Педант

If you never saw this **stuff** your life is wasted!

test case ['testkeIs] юр.
дело, имеющее принципиальное значение для разрешения ряда аналогичных дел; дело-прецедент

Maple Is Turning To The Augean Stables ?

A Greek hero who was able to user river's power (without naming directly Augean Stables!)

"Edwin Clark" Maple bug

"Joe Riel" Maple bug

complained to Waterloo Maple

longstanding bug in **Maple's**

1 ---> IDEA: Search for "Dirac Maple bug"
"sin Maple bug" etc

2 ---> SEARCH FOR:
2 --->
2 ---> automating testing, bug finding, or developing
2 --->
2 ---> !!! VERY GOOD DATA

"Edwin Clark" Maple bug

"Joe Riel" Maple bug

complained to Waterloo Maple

longstanding bug in Maple's
Maple unusable
didn't received any answer.

1) free patch
2) have to upgrade

LOOK FOR

1. Maple cannot handle
2. int(exp(sqrt(x)+x^2),x)
3. Calculus of Several variables, Maple commands
4. a*sin(x)+b*cos(x)
5. a*sin(x)+b*cos(y)
6. sin Maple bug
7. 3*sin(x)+4*cos(x) = 5*sin
8. evalf(int(x/surd(x^2-9,5), x=-4..5));
9. surd(x^2

Maple by hand
Maple stumped
Error in Maple
Maple have to upgrade
Maple inconsistency
Is this a bug in maple?
Maple test suite
Maple benchmark test
does not any improvement
don't believe the situation
Maple bug report
Maple defect
Maple error

Maple weakness
MVR2
MVR3
MVR2 dsolve
Maple fixed
kogeddes@daisy.waterloo.edu
Maple bugged
Maple buggy
Nasty Maple bug
Horrible Mapel bug
Maple V Release 1 (
Maple V Release 2 (
Maple V Release 3 (
evalf(int(sqrt(1-sin(x)*cos(x)),x=0..Pi,continuous)
Bug in laplace
Jeffrey P. Golden
SIN Moses
Maple Gradshteyn
Error cannot evaluate boolean
Maple mistake
Maple weakness
Maple maximize Boolean
Maple readability
Maple shame
Maple hate
Maple sad
Maple shameful
Maple fuck
Maple absurd
Maple disgraceful
Maple disgrace
Maple fork out
Maple another bug
Maple oddity

Maple crap
Maple frustrating
Maple unreadable
Maple time-consuming
Maple nonsense

Maple waste
Maple wasting
Maple wasted
MAPLE BUGS LIST – crap
Maple feature
Maple best
Maple friendly
Maple bad luck
Maple ill luck
Maple unable
Maple feature
Maple beautiful
Maple ugly
Maple weird
geddes example 6.10 (p.260)

http://www.hrz.uni-oldenburg.de/software/maple/mug/ ← **MANY NEW MAPLE BUGS**

Maple 8 > **int(arctan(tanh(z)), z= 0..1);**

```
-1/2*I*ln(exp(2)-I)-1/2*I*ln(((-I)^(1/2)+exp(1))/(-I)^(1/2))-1/2*I*dilog(1+exp(1)
/(-I)^(1/2))+1/2*I*dilog(1-(1/(-I)^(1/2)))+1/2*I*ln(exp(2)+I)+1/2*I*ln(1-I)-
1/2*I*dilog(1-exp(1)/(-I)^(1/2))+1/2*I*dilog(11/(-I)^(1/2))-1/2*I*dilog(1+(-
1)^(3/4))+1/2*I*ln(1+exp(1)*(-1)^(3/4))+1/2*I*ln(1-exp(1)*(-1)^(3/4))+1/2*I*
dilog(1+exp(1)*(-1)^(3/4))-1/2*I*ln(1+I)-1/2*I*ln(((-I)^(1/2)-exp(1))/(-
I)^(1/2))+1/2*I*dilog(1-exp(1)*(-1)^(3/4))-1/2*I*dilog(1-(-1)^(3/4))
```

Maple 8 > **evalf(%);**

```
.3949462000+.9e-9*I
```

???? evalf(-1/2*I*ln(exp(2)-I)+1/2*I*ln(1+exp(1)*(-1)^(3/4))-1/2*I*dilog(1-exp(1)/(-I)^(1/2))+1/2*I*dilog(1+exp(1)*(-1)^(3/4))+1/2*I*ln(1-I)-1/2*I*dilog(1-(-1)^(3/4))+1/2*I*dilog(1-(1/(-I)^(1/2)))-1/2*I*ln(1+I)+1/2*I*ln(1-exp(1)*(-1)^(3/4))+1/2*I*ln(exp(2)+I)-1/2*I*ln(((-I)^(1/2)-exp(1))/(-I)^(1/2))-1/2*I*dilog(1+exp(1)/(-I)^(1/2))+1/2*I*dilog(11/(-I)^(1/2))-1/2*I*dilog(1+(-1)^(3/4))+1/2*I*dilog(1-exp(1)*(-1)^(3/4))-1/2*I*ln(((-I)^(1/2)+exp(1))/(-I)^(1/2)));

Maple 9.5.1> int(int(int(((x*y*z)^(1/7))/(x+y+z), x=0..1), y=0..1), z=0..1);

```
int(eval(int(7*y*z^2*sum(1/7/_R^6*ln(-_R),_R = `freeze/R2`)+7*y^2*z*sum(1/7/_R^6*ln(-_R),_R =
`freeze/R2`)+7*(y*z)^(1/7)-7*y^2*z*sum(1/7/_R^6*ln((y*z)^(1/7)-_R),_R = `freeze/R2`)-
7*y*z^2*sum(1/7/_R^6*ln((y*z)^(1/7)-_R),_R = `freeze/R2`),y = 0 .. 1),{`freeze/R2` =
RootOf(_Z^7+y^2*z+y*z^2)}),z = 0 .. 1)

evalf(%);

int(-.1431889977e-8*(-25865840.*z^(36/7)*RootOf(_Z^7+y^2\
*z+y*z^2)^12-17907120.*z^(40/7)*RootOf(_Z^7+y^2*z+y*z^2)\
^8-349188840.*z^(55/7)*ln(-1.*RootOf(_Z^7+y^2*z+y*z^2))-\
```

```
87297210.*z^(45/7)*RootOf(_Z^7+y^2*z+y*z^2)^10-349188840\
.*z^(41/7)*RootOf(_Z^7+y^2*z+y*z^2)^14*ln(z^(1/7)-1.*Roo\
tOf(_Z^7+y^2*z+y*z^2))-58198140.*z^(31/7)*RootOf(_Z^7+y^\
2*z+y*z^2)^17-26860680.*z^(54/7)*RootOf(_Z^7+y^2*z+y*z^2\
)-19399380.*z^(39/7)*RootOf(_Z^7+y^2*z+y*z^2)^9-11639628\
0.*z^(29/7)*RootOf(_Z^7+y^2*z+y*z^2)^19-38798760.*z^(50/\
7)*RootOf(_Z^7+y^2*z+y*z^2)^5-31744440.*z^(52/7)*RootOf(\
_Z^7+y^2*z+y*z^2)^3-12252240.*z^(46/7)*RootOf(_Z^7+y^2*z\
+y*z^2)^2+349188840.*z^(55/7)*ln(z^(1/7)-1.*RootOf(_Z^7+\
y^2*z+y*z^2))+349188840.*RootOf(_Z^7+y^2*z+y*z^2)^14*z^(\
41/7)*ln(-1.*RootOf(_Z^7+y^2*z+y*z^2))-116396280.*z^(44/\
7)*RootOf(_Z^7+y^2*z+y*z^2)^11-174594420.*z^(43/7)*RootO\
f(_Z^7+y^2*z+y*z^2)^12-34918884.*z^(51/7)*RootOf(_Z^7+y^\
2*z+y*z^2)^4-14549535.*z^(43/7)*RootOf(_Z^7+y^2*z+y*z^2)\
^5-232792560.*z^4*RootOf(_Z^7+y^2*z+y*z^2)^20-232792560.\
*z^(48/7)*ln(-1.*RootOf(_Z^7+y^2*z+y*z^2))-38798760.*z^(\
33/7)*RootOf(_Z^7+y^2*z+y*z^2)^15-11639628.*z^(47/7)*Roo\
tOf(_Z^7+y^2*z+y*z^2)-13693680.*z^(44/7)*RootOf(_Z^7+y^2\
*z+y*z^2)^4-12932920.*z^(45/7)*RootOf(_Z^7+y^2*z+y*z^2)^\
3-23279256.*z^(37/7)*RootOf(_Z^7+y^2*z+y*z^2)^11-4655851\
2.*z^(32/7)*RootOf(_Z^7+y^2*z+y*z^2)^16-33256080.*z^(34/\
7)*RootOf(_Z^7+y^2*z+y*z^2)^14+232792560.*RootOf(_Z^7+y^\
2*z+y*z^2)^21*z^(27/7)*ln(-1.*RootOf(_Z^7+y^2*z+y*z^2))-\
29099070.*z^(53/7)*RootOf(_Z^7+y^2*z+y*z^2)^2-77597520.*\
z^(30/7)*RootOf(_Z^7+y^2*z+y*z^2)^18-21162960.*z^(38/7)*\
RootOf(_Z^7+y^2*z+y*z^2)^10-16628040.*z^(41/7)*RootOf(_Z\
^7+y^2*z+y*z^2)^7-49884120.*z^(48/7)*RootOf(_Z^7+y^2*z+y\
*z^2)^7-29099070.*z^5*RootOf(_Z^7+y^2*z+y*z^2)^13-349188\
840.*z^6*RootOf(_Z^7+y^2*z+y*z^2)^13-43648605.*z^7*RootO\
f(_Z^7+y^2*z+y*z^2)^6-58198140.*z^(47/7)*RootOf(_Z^7+y^2\
*z+y*z^2)^8-4293082794.*z^6*RootOf(_Z^7+y^2*z+y*z^2)^6-6\
9837768.*z^(46/7)*RootOf(_Z^7+y^2*z+y*z^2)^9-24942060.*z\
^(55/7)-11085360.*z^(48/7)+232792560.*z^(48/7)*ln(z^(1/7\
)-1.*RootOf(_Z^7+y^2*z+y*z^2))-232792560.*z^(27/7)*RootO\
f(_Z^7+y^2*z+y*z^2)^21*ln(z^(1/7)-1.*RootOf(_Z^7+y^2*z+y\
*z^2)))/z^(41/7)/RootOf(_Z^7+y^2*z+y*z^2)^6,z = 0. .. 1.)
```

http://www.bible-history.com/babylonia/BabyloniaCode_of_Hammurapi.htm

HAMMURAPI'S CODE OF LAWS

229 If a builder build a house for some one, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death.

230. If it kill the son of the owner the son of that builder shall be put to death.

231. If it kill a slave of the owner, then he shall pay slave for slave to the owner of the house.

232. If it ruin goods, he shall make compensation for all that has been ruined, and inasmuch as he did not construct properly this house which he built and it fell, he shall re-erect the house from his own means.

233. If a builder build a house for some one, even though he has not yet completed it; if then the walls seem toppling, the builder must make the walls solid from his own means.

http://groups.google.com/groups?hl=en&lr=&safe=off&selm=2527%40daily-planet.concordia.ca

From: Gene Ward Smith (gsmith@abacus.uucp)
Subject: Bug in Maple factor() function
Newsgroups: sci.math.symbolic
Date: 1992-02-04 19:41:44 PST

```
I mentioned the bug in the Maple fsolve() function--this is a much
more serious bug. The factor() function factors polynomials over the
rationals, and is what might be termed a "service" function; one often
called by other Maple functions. If it is unreliable, it means all the
functions which call it are also unreliable. The result is something
like a bug in the integer multiply routine, and basically constitutes
unrelability beyond the bounds of the acceptable in a computer algebra
system.

Here are some examples:

We have p6 and p9 in Z[t], and p15 is their product. Naturally, for
any specialization of t to a particular rational number p/q, the
polynomial p15 will also factor. In fact, for integer values of t
between -100 and 100, we find fifteen values where it does not
factor--the polynomial is falsely determined to be irreducible.  These
values are -95, -87, -81, -77, -62, -42, -29, -15, 10, 15, 48, 55, 66,
88, 93.  There seem to be vague hints of a pattern in these numbers,
but it is difficult to say quite why one factors and another does not.

p6 := x**6-2*t*x**3-t*x**2+t**2;
p9 := x**9-x**8+3*t*x**6+t*x**5+t*x**4+3*t**2*x**3+2*t**2*x**2+t**3;
p15 := x**15-x**14+x**12*t+2*x**11*t+2*x**10*t-2*x**9*t**2-4*x**8*t**2-3*x**7*t
**2-2*x**6*t**3-x**6*t**2-6*x**5*t**3-x**4*t**3+x**3*t**4+x**2*t**4+t**5;

These first examples were obtained by generalizing the polynomial
for t = 10. Almost at random, I wrote down the following and tested
factorization:

f7 := x**7+t**2*x**2+t**2;
f11 := x**11-t*x**5+t**3;
f18 := x**18+t**2*x**13-t*x**12+t**2*x**11-t**3*x**5+t**5*x**2+t**5;

Lo and behold, between -40 and 40 I found two examples where these did
not factor, either (at t = -20 and -9.) It seems clear that numerous
examples of the failure of factor() can be generated almost at will.

It would be very useful to have code giving a patch to this bug
posted to the net. However, it appears to be possible to trick
it into working (but how much of the time?) in a manner analogous
to the fsolve() kludge. I've had good results with:

ff := proc (h) factor(expand((x**3-x-1)*h))/(x**3-x-1) end;

as a replacement for factor(), but who knows what evil lurks in the
heart of these routines?

--
     Gene Ward Smith/Brahms Gang/CICMA/Concordia University
                  gsmith@concour.cs.concordia.ca
```

Read full story

From: Keith O. Geddes (kogeddes@daisy.waterloo.edu)
Subject: Re: exp(-t) =? exp(t) in Maple

View: Complete Thread (4 articles)

```
In article <1991Jul5.180039.28794@cs.yale.edu> zador-anthony@cs.yale.edu (Tony Zador)
writes:
>How can I make Maple 4.2 realize that exp(-t) = 1/exp(t) ?
>
>> readlib(laplace):
  . . .
  . . .

>> laplace(exp(-t),t,s);
>                                      1
>                                   -------
>                                    s + 1
>
>> laplace(1/exp(t),t,s);
>                                     1
>                            laplace(--------, t, s)
>                                    exp(t)
>
>More generally, the problem seems to be:
>
>> exp(-t) - exp(-t);
>
>                                      0
>> exp(-t) - 1/exp(t);
>                                          1
>                               exp(- t) - --------
>                                          exp(t)
>
>
>I'm sure this must be some mistake on my part.
>
>Tony Zador
>zador@cs.yale.edu


No, not a mistake on your part.

First, it is a bug in maple4.2 that laplace does not simplify its input
expression into the form that it will like.
This is not a bug in Maple V.

Second, in all versions of Maple the expression  exp(-t) - 1/exp(t)
will not *automatically* simplify to zero.  There are two different
representations here.  Explicitly applying the 'simplify' function will
do the job.

================================================================================

     |\^/|      MAPLE V
._|\|   |/|_.  Copyright (c) 1981-1990 by the University of Waterloo.
 \  MAPLE  /   All rights reserved.  MAPLE is a registered trademark of
  <____ ____>  Waterloo Maple Software.
```

```
      |        Type ? for help.
#
# How can I make Maple 4.2 realize that exp(-t) = 1/exp(t) ?
#
> readlib(laplace):
> laplace(exp(t),t,s);
                                        1
                                      -----
                                      s - 1

> laplace(exp(-t),t,s);
                                        1
                                      -----
                                      s + 1

# KOG> In Maple V the following works as it should.
#
> laplace(1/exp(t),t,s);
                                        1
                                      -----
                                      s + 1

# KOG> In Maple 4.2 you will have to explicitly apply 'simplify' to the
# KOG> input expression being passed to the laplace function.
#
> simplify(1/exp(t));
                                    exp(- t)

> laplace(",t,s);
                                        1
                                      -----
                                      s + 1

# More generally, the problem seems to be:
#
> exp(-t) - exp(-t);
                                        0

> exp(-t) - 1/exp(t);
                                              1
                                 exp(- t) - ------
                                            exp(t)

# KOG> The above is not supposed to simplify automatically.
# KOG> Applying the 'simplify' command will do the simplification.
#
> simplify(");
                                        0

> quit

============================================================================

Keith Geddes
Symbolic Computation Group
Department of Computer Science
University of Waterloo
Waterloo, Ontario                   kogeddes@daisy.uwaterloo.ca
Canada N2L 3G1                      kogeddes@daisy.waterloo.edu
```

http://mathforum.org/epigone/sci.math.symbolic/whonflingul/88k143$5ek$1@nntp.itservices.ubc.ca

Subject: Re: About Maple Bugs
Author: Robert Israel <israel@math.ubc.ca>
Organization: Mathematics, University of British Columbia, Vancouver, Canada
Date: 18 Feb 2000 17:56:19 GMT

In article <38AD5FBC.AE16F2F9@recherche.enac.fr>,
jean-marc alliot <alliot@recherche.enac.fr> wrote:

>PS: BTW, I agree on the fact that Maple is an excellent tool, but with this
>bug, it is completely useless as soon as you mix trigonometric functions with
>solving quadratic equations. And you do that very often when you try to do
>aircraft conflict predictions for example.

Ummm... I hope nobody is using Maple (or any other computer algebra
system, for that matter) for air traffic control. I like Maple,
but I wouldn't trust it with my life.

The license for some software includes a sentence such as
"... is not designed or intended for use in on-line control
of aircraft, air traffic, aircraft navigation or aircraft
communications; or in the design, construction, operation or
maintenance of any nuclear facility."

If Maple doesn't say this, it should.

Robert Israel israel@math.ubc.ca
Department of Mathematics http://www.math.ubc.ca/~israel
University of British Columbia
Vancouver, BC, Canada V6T 1Z2

Read full story

Subject: Re: About Maple Bugs
Author: Preben Alsholm <ifakpa@pop.dtu.dk>
Organization: UNI-C
Date: Fri, 18 Feb 2000 14:29:04 +0100

if they promised you a patch they should send you one.

Read full story

Subject: Re: About Maple Bugs
Author: Gottfried Barthel <Gottfried.Barthel@uni-konstanz.de>
Organization: University of Constance, Germany
Date: Fri, 18 Feb 2000 18:25:56 +0100

What change in the code made that these releases can't do such a trivial
problem any longer is very mysterious.

Sarcastic Corollary: Advancing version numbers is not always progress.

Practical consequence: As long as you can afford the place for storage,
keep old versions; they don't have new bugs :-)

```
Your frustration is understandable, but I can't quite agree to your
harsh consequences. Maple surely has its weak points, and it is good to
know as many of them as possible, to make them known to other users,
especially to students who should still be advised to use their own
brain. But I am rather convinced that other programs have weak points of
their own as well. I still consider Maple a decent program. If things
are crucial, you should cross-check with older versions and other
programs.

--
Regards from Konstanz (Germany)
Gottfried Barthel

Mathematik & Statistik, Univ. Konstanz, Fach D203, D-78457 Konstanz
```

Read full story

```
From: Gene Ward Smith (gsmith@concour.cs.concordia.ca)
Subject: fsolve in Maple
Newsgroups: sci.math.symbolic
Date: 1992-01-29 17:13:35 PST


Anyone who has often used the 'fsolve' function in Maple to find real
or complex roots knows that it sometimes conks out and claims that
there is probably not enough precision. Resetting the precision often
doesn't help. A particularly horrible example of this is the following
polynomial:

x^8 + x^4 + 2;

This is horrible because the coefficients are so small, and the roots
are in fact extremely easy to find by solving the equation in
radicals.

Does anybody happen to know what in Hell is wrong with
Maple's 'fsolve' routine? Do other programs have any problem with this
particular polynomial?


--
     Gene Ward Smith/Brahms Gang/CICMA/Concordia University
                  gsmith@concour.cs.concordia.ca
```

http://www.scg.uwaterloo.ca/~maple_gr/Digests/Digest99.04

From: sussky@mail.giga.com
Subject: [MUG] Re: MAPLE and Macs
Date: Sun, 25 Apr 99 19:49:04 +500

I just discovered a strange feature in using Maple on a Mac:

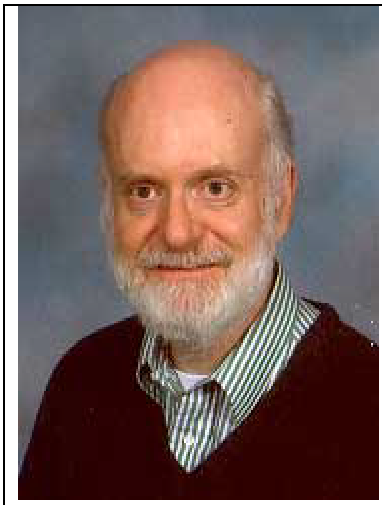
I had upgraded from MacOS 8.1 to 8.5. I then re-installed Maple (release 5.0) from the installation CD. As I openned a new Maple worksheet, I noticed a nasty bug that has been reported previously in this MUG forum, namely: the copying and pasting of Maple input is faulty, implying that what is pasted does not coincide with what was selected with the mouse. This is a serious drawback. I re-installed MacOS 8.1 in one of my HD partitions and re-installed Maple in this partition from the original CD, as I rebooted from the MacOS 8.1, I noticed that the above mentioned interface bug dissapeared.

Is there an incompatibility with MacOS 8.5? Has this been corrected in the R 5.1? (I have R 5.0)

I must manifest my protest and irritation to the fact that WMI mac developers simply and consistently ignore the protests that Maple users on the mac continuously post in the MUG forum. Why???

... I get the message "plot to large for open GL" Is this a joke? what is then the use of implementing the famous open GL?

Roberto Sussman, National University of Mexico (UNAM)



Read full story Jun 6, 1989 sci.math.symbolic
Gerald Edgar, Subject: Maple integral

```
Here's one that made me laugh.  It's my nomination for the
most absurd answer yet. Maple, version 4.2
>   int(exp(-x^4),x=0..100);        100
                                   /
                                  |           4
                                  |    exp(- x ) dx
                                  |
                                 /
                                 0
>   evalf("); # this will do a numerical integral.
                                              -43429375
                              .4660704837*10
```

Read full story Feb 6, 1998 sci.math.symbolic
Marc Roussel, Re:MapleVr4 crash

Other than a glitch in an early student edition (Maple V, Release 1 for DOS, I think), the only time I've seen Maple crash on any platform I use regularly (Unix, Win/DOS) is when I've made a mistake resulting in a self-referential variable.

Read full story

```
Subject:      Re: MapleVr4 crash
Author:       Robert Israel <israel@math.ubc.ca>
```

	Organization: University of British Columbia, Vancouver, B.C., Canada Date: 28 Jan 1998 23:39:43 GMT It's not uncommon for Maple to try a calculation that it isn't able to finish in a finite amount of time. In particular, this can happen with numerical integration when there is a singularity that Maple doesn't know about or can't take care of: it may keep trying smaller and smaller step sizes but never getting a small enough error estimate to end the calculation. Usually this doesn't cause a crash, it just keeps calculating until you hit the "stop" button. Sometimes it gets into a state where it doesn't even recognize the "stop" button, and there's nothing you can do but terminate the Maple program. If it actually crashes, this could be a memory problem - Maple doesn't always handle out-of-memory conditions gracefully.

Read full story

Subject: Re: MapleVr4 crash
Author: Dr. J. Greg Nash <gregnash@worldnet.att.net>
Organization: Centar
Date: Tue, 03 Feb 1998 16:22:02 -0800

I had to upgrade to R5 because R4 would crash every time (IPF) and in random locations! The developers say that it's a problem in the interface s/w, that is fixed in R5. However, I haven't heard anything about fixing the interface in R4. So beware.

Again, unfortunately, R5 has big bugs in it. I can't use any debug routines without getting more IPF crashes everytime. The developers say (again) that it's due to a bug in the interface s/w. As of yet, I don't know when (if?) R5 fixes will be available.

Read full story

Subject: Re: MapleVr4 crash
Author: Andre Poenitz <poenitz@mathematik.tu-chemnitz.de>
Organization: University of Technology Chemnitz, FRG
Date: 9 Feb 1998 08:55:04 GMT

Maple should *not* crash whatever the code it runs looks like.
And this should hold for any application...

Andre' Poenitz

PS: I have a worksheet that causes Maple to crash after some time although it runs well on smaller problems. And yes, the Maple people 'will have a look at it'.

```
PPS: I still prefer Maple...


--
Andre' Poenitz, TU Chemnitz-Zwickau, Fakultaet fuer Mathematik
poenitz@mathematik.tu-chemnitz.de ..... +49 3727 58 1381
```

```
Subject: re: numerical integration
     From: Harry Kneppers
<H.A.W.M.Kneppers@twi.tudelft.nl>

Talking about numerical integration.

The following example is surprising (at
least to me):

evalf(Int(floor(x),x=0..3));

Of course, this is a very easy exercise.
Maple V3, however, seems to find it
difficult.
Maple V2 does give an answer, but the answer
is wrong in the second digit, which is
rather poor
with Digits being equal to 10.

Has anyone met this type of problem?


Harry Kneppers.
```

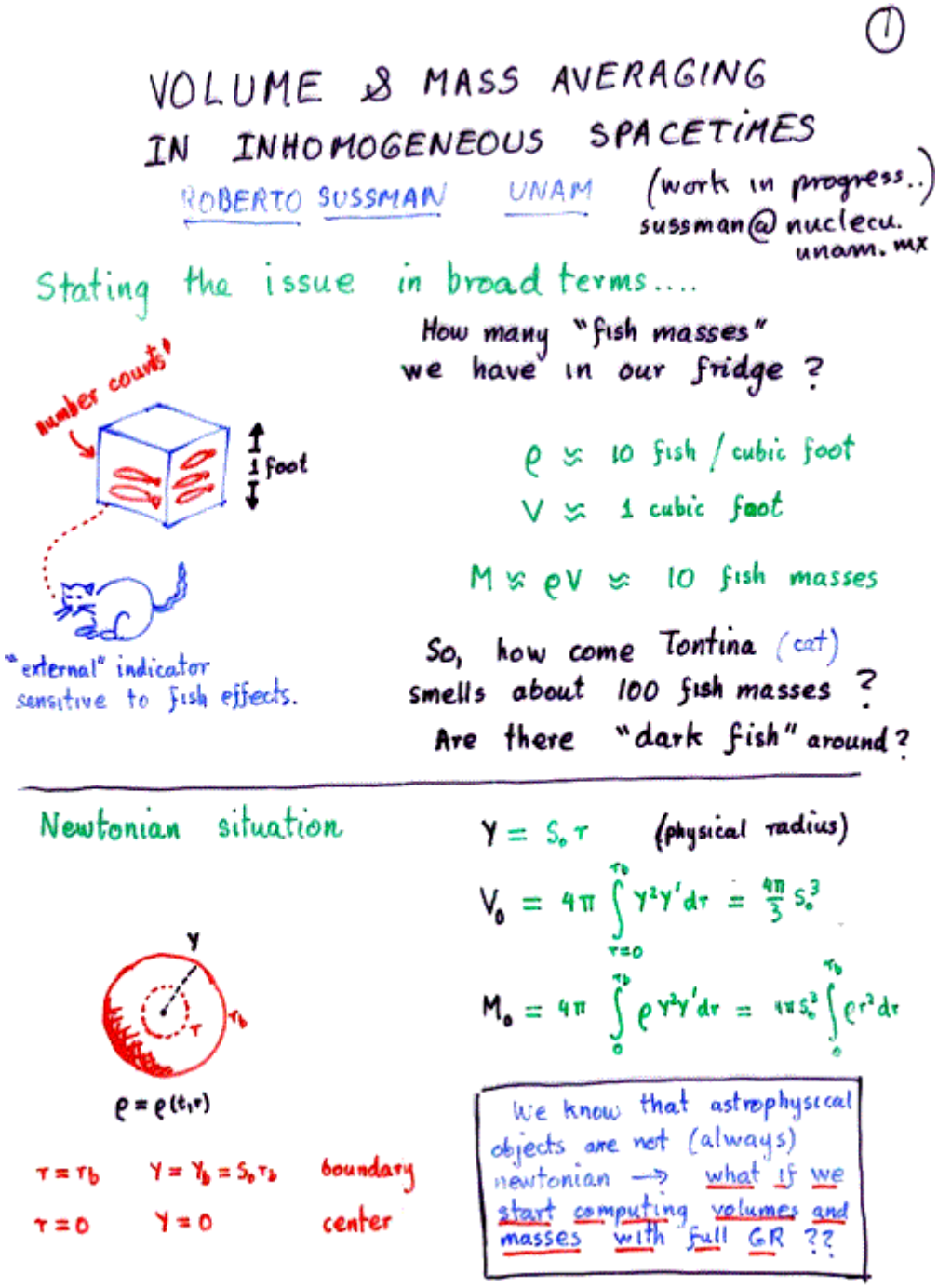
Read full story

From: Carl Devore (devore@math.udel.edu)
Subject: Re: Non constant time to perform a loop in a Maple program
Newsgroups: comp.soft-sys.math.maple, sci.math.symbolic
Date: 2002-02-08 09:00:44 PST

```
My experiment below shows that hash-table lookup is worse than O(n).
I know this seems shocking and unbelievable, but please read on.
```

Column 2 is the most disturbing. It implies that even trivial operations that hardly use any memory slow down dramatically as memory use increases.

This means that Maple, until the memory management is fixed, is unsuitable for most computations requiring a lot of memory. But even this general slowdown cannot fully explain the slowdown in columns 3 and 5, because the general slow down is subtracted.



to draw a lesson from smth. — извлечь урок из чего-л.
to draw the moral (of an experience) — извлекать мораль /урок/ (из происшедшего)

	Read full story You have found a real even function for which Maple thinks the integral is neither real nor odd. Maybe Maple can't do math but it sure is a great way to kill a Saturday afternoon. Stephen Weinstein

	weinss@rpi.edu

www.denison.edu/collaborations/fipse/econ/**boyd**.html	Read full story a one bit answer produced by an extensive computation is not entirely satisfactory, especially when we know that there have been and likely are bugs in the factorization routines. What Maple really does (I think) is to construct a proof of irreducibility by finding incompatible factorizations mod two or more moduli. Without setting printlevel = 50 or some such trick, which produces more information than is wanted, how about giving a summary of the reason that the polynomial is deemed irreducible, e.g. give the sequence of moduli and the corresponding degree sequences in response to, say "irreduc(f,certificate)"

Maple Under Mac

Read full story

From: ynunez@sprynet.com (ynunez@sprynet.com)
Subject: Printing Maple Vr4 on Power Mac
Newsgroups: sci.math.symbolic
Date: 1998/01/28

We have recently acquired 15 power macs. They are connected to a local network (apple talk, I beleive). Also connected to the network are 3 Epson 800 printers.

Maple has not been able to print at all. When we try to print we get a series of windows which appears to tell us that it is spooling etc.... yet nothing happens. No job is ever sent to the printer. Trying to print the same worksheet again, yields in a print error message.

If we attempt to print a preview we get a blank "page" which is grey. There is no indication of any page outline as in other print previews.

After speaking with Tech Support at Maple, I downloaded and installed the update that has fixed printing problems in the past, according to the tech rep. This has fixed nothing that is apperent to me.

Any thoughts and suggestions would be greatly appreciated. Please e-mail your responses to ynunez@oc.odessa.edu. Thank you in advance

Maple Under OS/2

Read full story

From: Yuri Muzychka (yuri@mhtl2.uwaterloo.ca)
Subject: Re: OS/2 Maple unstable for anyone else?
Newsgroups: sci.math.symbolic, comp.os.os2.scitech
Date: 1996/10/31

To date Maplesoft has not announce a fix for the memory leak. But if we all protest even those who paid real money for the latest version we might get the problem fixed.

I can't beleive that Maplesoft had the gall to say they discovered a flaw in OS/2. Its the only program that does this.

Early Webexploreres were prone to this but IBM fixed that problem. Why can't Maplesoft.!!!!!!!

Read full story
Oct 27, 1996, sci.math.symbolic, comp.os.os2.scitech
Joseph A. Giaime, OS/2 Maple unstable for anyone else?

I find that even simple worksheets can cause my system to hang and my swap file to expand to 75 Meg + despite less than 1 Meg reported on the maple window. I've got a pentium system with 32 Meg, and am running OS/2 warp ver 3 with fixpack 22 applied. This is the only OS/2 program I have that actually hangs the workplace shell, and it is the most expensive program on my disk...

I've been using maple for 5 years or so, but previously as a windoze application under OS/2. Now I've paid the big bucks to get the latest Maple OS/2 version, applied the latest Maple patch, and the damn thing resists my attempts to get any work done...

Read full story

From: Gary A. Churchh (church@netcom.com)
Subject: Re: OS/2 Maple unstable for anyone else?

```
Newsgroups: sci.math.symbolic, comp.os.os2.scitech
Date: 1996/11/06

At least OS/2 users aren't being completely ignored anymore; we're just
told to go sit in the back of the bus.
```

Maple Under UNIX

Online Assessment Online Assessment Areas

Testing and Assessment with MapleT.A.

Online Assessment Areas Online Assessment Areas
Placement Testing - automated
- Save time / money (no need to employ an army of TA's)
Homework drill and practice
- Make students accountable for doing their homework
JIT Teaching
- Just In Time - teach to where the students need to be taught
High Stakes Tests
- Quizzes, exams - students get immediate feedback

Top 10 Reasons to Think Before Investing in Maple

Increase in technical creativity
Acceleration of custom software development
Alternative to costly software
Optimum use of existing software
General technical productivity

Unstable
Inconsistent
Non-linear
Non-uniform
Randomized

28. Maple 9.5.1 is a strongly non-linear environment where the most fundamental math properties (uniqueness of the answer for a good-defined problem, commutativity property, linearity property etc) now hold now fail in a random fashion, thus Maple breaks down grotesquely.

Read full story

Subject: Divison by 1.0 in solve
Author: Jens Krause <jkrause@maipo.ee.ethz.ch>
Organization: Swiss Federal Institute of Technology, Zurich
Date: 19 Jan 2000 14:16:16 +0100

I have a very simple case where the 'solve' function does not work:

```
>     |\^/|     Maple V Release 5 (WMI Campus Wide License)
>._|\|   |/|_. Copyright (c) 1981-1997 by Waterloo Maple Inc. All rights
> \  MAPLE  /  reserved. Maple and Maple V are registered trademarks of
> <____ ____>  Waterloo Maple Inc.
>      |       Type ? for help.

>> solve(a=1.0*b,b);
>> _SolutionsMayBeLost;
>                                    true
```

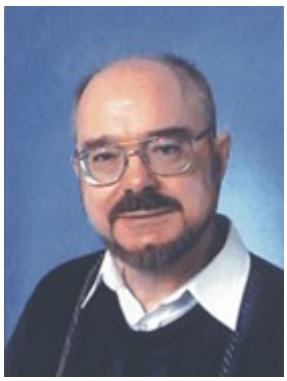
Read full story

From: "Marc A. Murison" <murison@aa.usno.navy.mil>
Subject: [MUG] Re: Anyone experiences the same problem with Maple V R5.0 ?
Date: Wed, 17 May 2000 18:40:19 -0400

The crash-on-print when the Maple doc contains plots (especially 3D plots) is a longstanding problem, torturing us for many years now. There is no remedy, since it is a bug in the Windows version of Maple that the Waterloo folks either cannot find or don't care enough to look for. **I'm usually told by them that there's something wrong with my video driver, but the bug happens with different video drivers and hardware on many different machines over at least the past 5 years.** It is unfortunate that Waterloo refuses to take this bug seriously. However, you can once in a while get around the problem by trying different printer drivers. I have several different postscript printer drivers installed just for this purpose, though the success rate is very low. You can also export as HTML or LaTeX, though that's certainly no real solution and is often unacceptable, depending on your purpose. Maple 6 behaves slightly better for me than the previous version or two, but the problem is definitely still there and still a show stopper. **You are certainly not alone in your extreme frustration!**

--
Marc A. Murison
Astronomical Applications Dept.
U.S. Naval Observatory
3450 Massachusetts Ave, NW
Washington, D.C. 20392-5420
http://aa.usno.navy.mil/murison/
mailto:murison@aa.usno.navy.mil

Utinam logica falsa tuam philosophiam totam suffodiant!



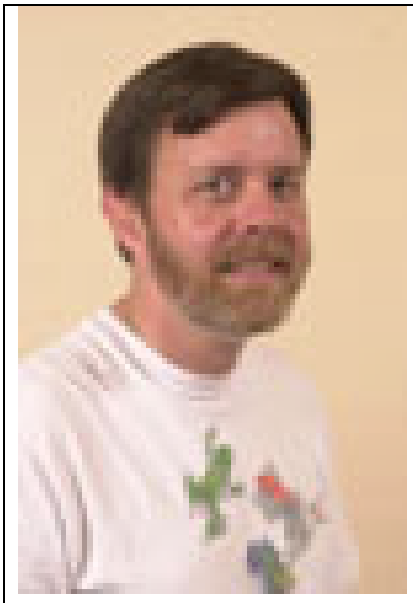
Read full story May 2, 2000 MUG

Helmut Kahovec, Printing inline graphics crashes maple6, windows version

just a few moments ago I sent in the following bug report to the support division of Waterloo Maple Inc.

Helmut

| Dear Maple Support,
|
| As it has already been reported in comp.soft-sys.math.maple and MUG, windows user
| cannot print maple6 worksheets containing inline graphics if they use true color
| (2^24 bit) or high color (2^16 bit). Doing so crashes the maple6 application.
|
| Specifically, I am a registered user of the full version of maple6 running on a PC
| with MS Windows NT 4.0, service pack 5, with a true color Matrox Millenium graphics
| adapter card. **I never experienced any difficulties while printing worksheets with**
| **inline graphics in earlier Releases of MapleV while working on the same hardware.**
|
| Since this printing bug is a VERY serious one I urgently ask you to put a patch for
| download somewhere on your web site as soon as possible.
|
| Please, do not assume that I'm a first time or an unexperienced user of the Maple
| CAS. I assure you that this bug is definitely not a user error.
|
| With kind regards,
|
| Helmut Kahovec



Read full story Jul 25, 2001 MUG
Tim McLarnan, [MUG] Elliptic Integral Bug

Maple has been incorrectly calculating the values of incomplete elliptic integrals at least since Maple V. The errors are not small - in one example, Maple computes a value of 1.80+0.62i when the correct answer is 0.27+0.97i. Similarly, with the EllipticF function, Maple gives the value -.008504510023 + 1.374884128 I Working out numerically the defining integral for this function yields 2.193595226 + .5178375879 I

these two calculations should have given the same result, and they do not. this is a problem that could bite any user

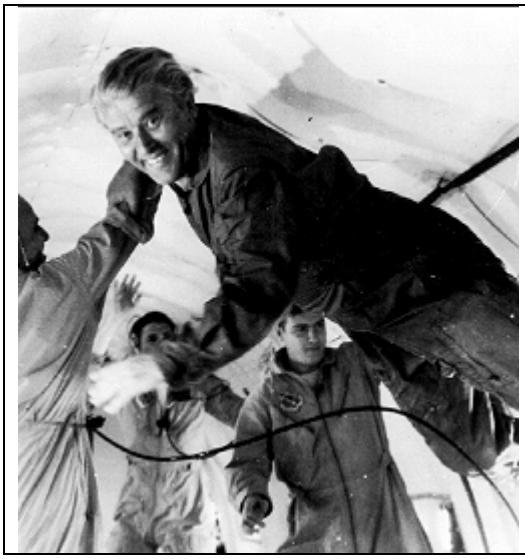
it's extremely alarming to me that one seems not to be able to rely on Maple correctly to compute the values of fundamental functions, and that bugs of this sort can persist for so many years.

Read full story integration of rationals of trigs (31.10.96) Thierry Guitard

it is en passant a shame for high end package that the TI 92 (a customized version of the old fashionedderive software) gives the correct answer

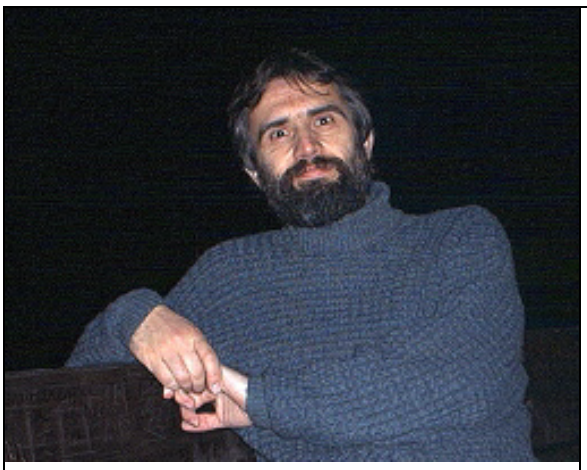
Werhner Von Braun:

Crash programs fail because they are based on theory that, with nine women pregnant, you can get a baby a month.

	**Werhner Von Braun:** Basic research is what I am doing when I don't know what I am doing.

	Werhner Von Braun: I have learned to use the word 'impossible' with the greatest caution.

	Martin Roscheisen: One good QA member must identify 100 times more problems than all the developers can fix. Aug 9, 2000, 4:17 p.m.



Read full story Feb 28, 2002 MUG
Michal Marvan, Maple and Apple problems

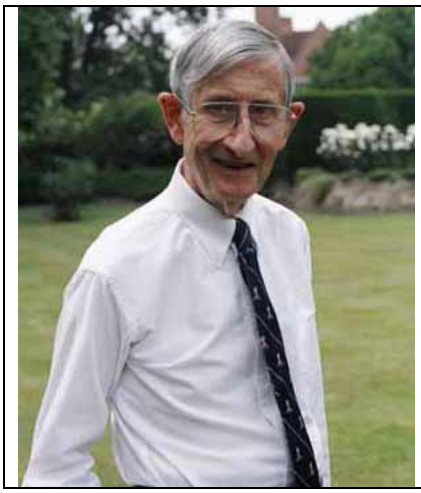
1. Commas are invisible after big closing parentheses - … products are indistinguishable from expression sequences.

2. A minus sign following a fraction overlaps with the fraction bar. … subtractions are poorly distinguishable from products.

when typing with cursor at the end of line, the text may appear on the next line!
How this bug could survive from version 5.4 to version 7 !

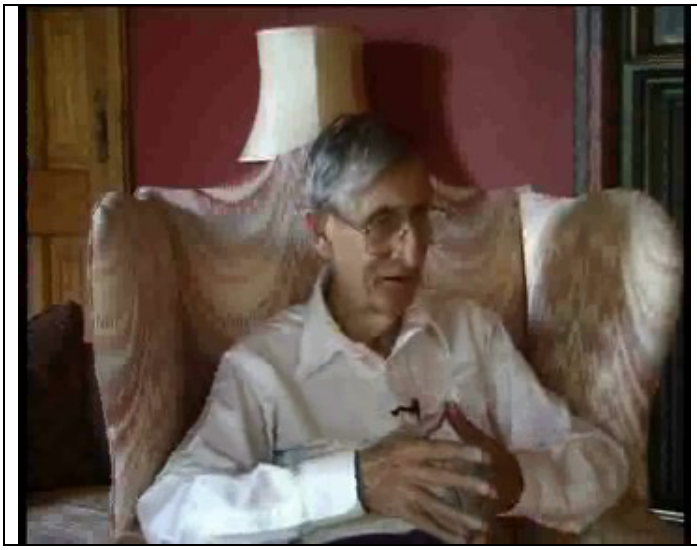
Freeman Dyson:

I've never remembered a time when I wasn't in love with calculating. One of the first memories I have was when I was still being put down for a nap in the afternoons. I was in the crib and not able to climb out, and I was calculating the infinite series, 1+1/2+1/4+1/8+1/16... and discovered that it came out to 2.



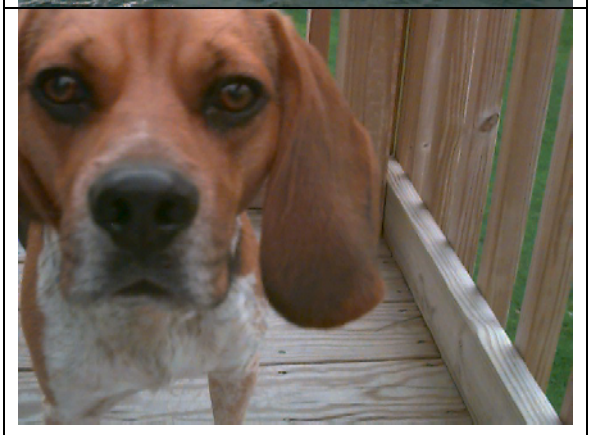
Freeman Dyson:

Anger is creative; depression is useless



Freeman Dyson:

The bottom line for mathematicians is that the architecture has to be right. In all the mathematics that I did, the essential point was to find the right architecture. It's like building a bridge. Once the main lines of the structure are right, then the details miraculously fit. The problem is the overall design



Read full story

Jun 9, 2000 MUG
Rafal Ablamowicz
[MUG] Very bad bugs in `define/multilinear`, and etc.

There are terrible bugs in `define/multilinear`, `define/flat`, and `define/skeleton` which prevent any serious use of the first two options. `define/skeleton` is an internal procedure that `define/...` uses and it needs fixing too.

We have wasted a considerable amount of time when trying to use `define/multilinear` in our own programing before we realized that these bugs existed. See also our second "bug" submission on `define/multilinear`. **It is very unfortunate that not for the first time we have found that one cannot trust Maple code and that often it is better to write one's own code to replace Maple's built-in functions.** This should not be the case though.

Read full story May 4, 2000 MUG
Peter Chan, Anyone experiences the same problem with Maple V R5.0 ?

Have you ever tried the following with Maple V R5.0 under Windows 98?

If you are running Maple V R5.0, close the application and then follow the following steps:

1. Start Maple V R5.0 under Windows 98

2. Type in the following command line: > plot({sin(x),cos(x)},x=0..4*Pi,color=[red, blue]);

3. Press ENTER to execute the command line

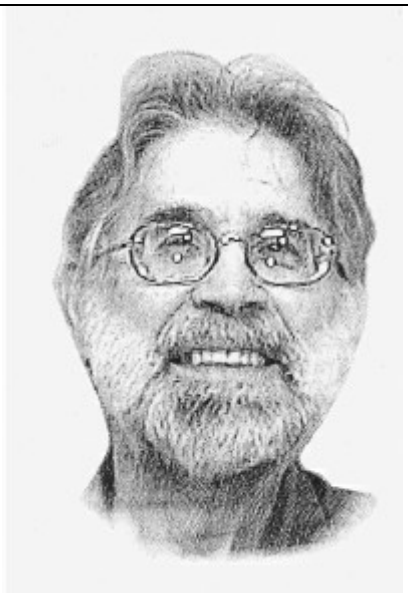
4. Click "File"

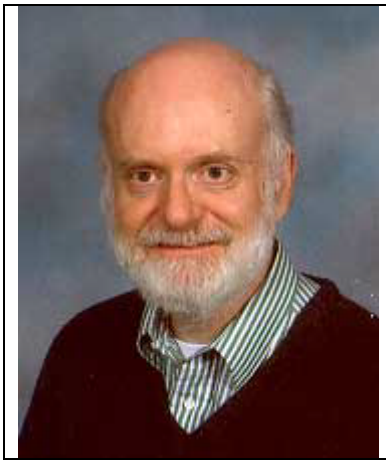
5. Click "Print Preview ..."

6. Maple crashes

Please, do not assume that I'm a first time or an inexperienced user of the Maple CAS.

I assure you that this problem is definitely not a user error.



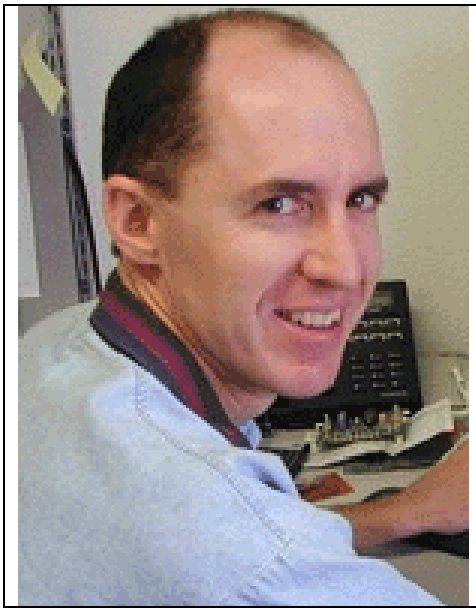


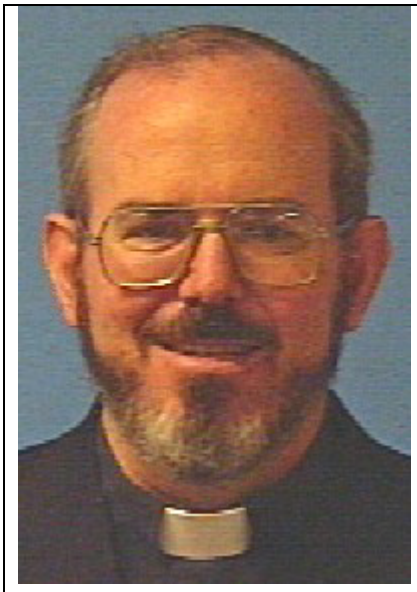
Read full story Nov 11, 2004 comp.soft-sys.math.maple
G. A. Edgar, Fun with Maple (hypergeom)

```
> hypergeom([1/4, 1/2, 3/4, 1, 2, 9/4, 5/2], [9/8, 5/4, 11/8,
  3/2, 13/8,15/8], y):
> convert(%, StandardFunctions);

Error, (in int/flookup/pfddupl/abe) numeric exception:
division by zero
```

[This is a regression bug. Maple 7, Maple 6, Maple V Release 5 work well here. — VB]





Read full story Mar 26, 1999 MUG
Mike May, zero times vector becomes a number

While setting up a worksheet for linear algebra students I ran into an interesting feature. Using evalm, a scalar times a vector is a vector, unless the scalar is zero, when the result is not the zero vector, but the number zero. This causes problems with things like pointplot3d which wants a list of vectors and chokes if zero is put in.

Any suggestions for how to make Maple behave properly and return the zero vector? I am getting the same behaviour in V5R4, and V5R5.

The sample offending code is:
```
> vec := vector(3,[1,2,3]):
> evalm(2*vec); evalm(0*vec);
   [2, 4, 6]
   0
```

The cursor bug is due to an (normally) invisible linefeed at the end of each line. Turn on "Show invisibles" and you can see what happens. It can also be seen by watching the toolbar change as you hit a single 'left-arrow' at the end of a line.

I'm becoming increasingly frustrated with the lack of support for Macintosh by Waterloo. A year ago Apple moved to a Unix base and a version hasn't come out for that, yet Linux versions are there. There are free X servers for Mac OS X, so it's almost just a simple recompile with a new target cpu. Looking at the (publicly available) beta web page shows that Maple 8 is being developed for Windows -- where is the Mac version? Nowhere in site ... Waterloo: If you're listening, the Mac market is still larger than the Linux base...

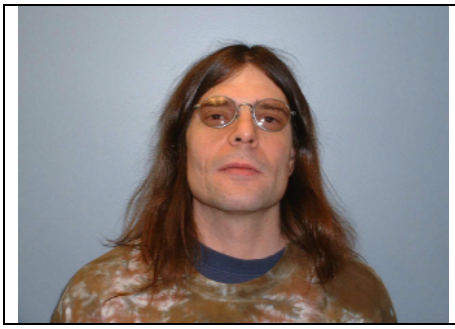
Read full story

These are examples that were working satisfactorily with Rel. 2. I have been very disappointed with some of the results from Rel. 3. The following illustrates some of my frustration.

The "RootOf" expressions are annoying, since it is something else I have to explain to my students, but it is easy enough to display the explicit solutions (Must not forget the damn 'd' option, or you can get non-solutions as well. Why isn't that the default? Or why can't Maple get them all and throw away those that aren't solutions?):

It still ignores the possibility of division by 0 in solving some algebraic equations without catastrophe

```
don't sacrifice usability to completeness.
```



Read full story Nov 11, 2004, comp.soft-sys.math.maple
Carl Devore, Re: Compatibility of packages and articles

..this only helps if you have an older version.

I think Maplesoft should provide one [an older version of Maple] for free for purchasers of the newer Maple for this purpose if they don't already.

Read full story

Apr 18, 2002 MUG
Robert Israel, Finding the maximum value of a function over a range

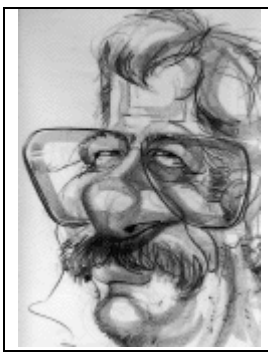
maximize has a number of bugs.

Read full story

Bug in maximize with trig functions in Maple V.3 to Maple V.5 (6.2.97)

Don't use "maximize" and "minimize"!

They are unreliable at best and misleading at worst.



Read full story **David L. Johnson**
Bug in maximize with trig functions in Maple V.3 to Maple V.5 (6.2.97)

```
> maximize(sin(x)+cos(x),x,0..0.2);

                      1/2
                     2
```

I try not to let students know about the maximize() function

From: "J.M. Redwood" <jmr@bella-vista.demon.co.uk>
Subject: [MUG] maple 6.01 maximize
Date: Thu, 7 Dec 2000 17:29:04 -0000

>> From: "J.M. Redwood" <jmr@bella-vista.demon.co.uk>

I can't get the commands "minimize / maximize" in Maple 6.01 to work with a simple trig expression, whereas in Maple V Rel 5.1 they worked fine. For example, in Maple V Rel 5.1,

```
>  x1(t) := -.04070375628*cos(5.118786816*t)  + .04070375628*cos(16.68728700*t):
>  x1_max := maximize(x1(t),{t},'infinite');

        x1_max := .08140751256  #
```

obviously true

In Maple 6.01 the expression returns unevaluated , thus

```
>  x1_max := maximize(x1(t),t=0..infinity);
 x1_max := maximize(-.04070375628 cos(5.118786816 t) +.04070375628cos(16.68728700 t), t = 0 .. infinity)
```

It seems that one has to write several lines of code to persuade Maple 6.01 to find a maximum, and similarly for a minimum. Or, have I misunderstood something? Is there a way of doing in Maple 6.01 what was so easy in Maple V Rel 5.1, please?

John Redwood

Read full story

From: stefan@scarlett.mathematik.Uni-Osnabrueck.DE
Subject: Re: more maximize problems

Another problem: The minimize/maximize procedures don't recognize
ranges correctly: The minimum obtained may be outside the given bounds.

This occurs even in one of the examples displayed by '?maximize':

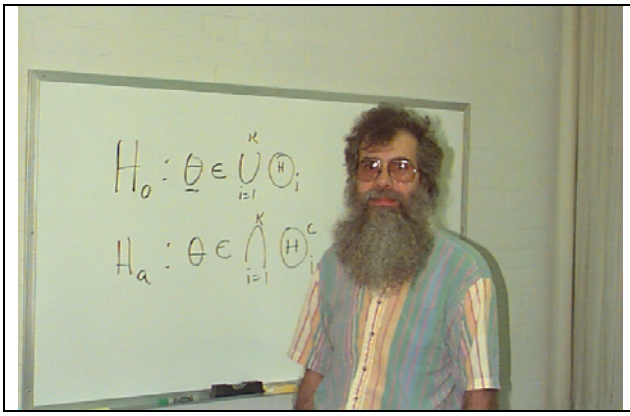
```
> minimize(x^2 + y^2, {x,y}, {x=-10..10, y=10..20});

                                0
```

The correct answer should of course be 100, reached at (x,y)=(0,10).

I am surprised that such an obvious flaw got into Release 3
without notice.

Stefan Nohl, Osnabrueck



Read full story

From: berger@stat.ncsu.edu (Roger Berger)
Subject: more maximize problems

The Maple V Release 3 maximize function seems to give wrong answers, even with fairly simple, smooth functions, as the following session shows.

When can it be trusted?

Wolfgang Ziller

bugs in fsolve, implicitplot, int in Maple V.3 and Maple V.4 (27.2.97)

BUG 3:

The following integral

```
int(sqrt(x)*sqrt(1+1/x),x);
```

which you can easily do by hand gives 2/5(x+1)^3/2 in V3 and the correct answer 2/3(x+1)^3/2 in V4 .

Since this example is so simple, does someone understand what the bug in V3 was? Very puzzling how it can get it so wrong.

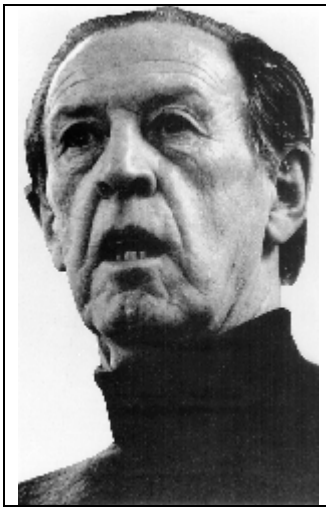
I understand that you can "circumvent" it with

```
value(combine(Int(sqrt(x)*sqrt(1+1/x),x)));
```

but my calculus students just laughed at me (or got mad) when I presented that "solution".

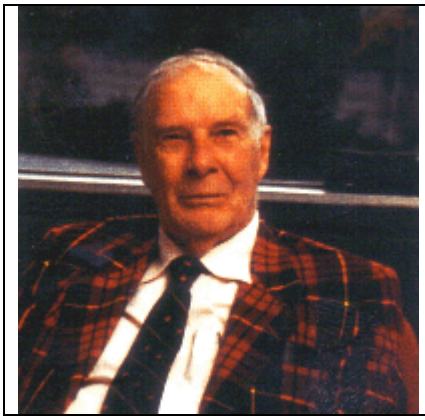
In fact Maple did not "pass" my midterm because of problems of the above type. Maple has a hard time with arclength and surface area problems. I learned the hard way that I cannot just assign standard problems from the book, thinking that Maple must be able to do this since my students can. V4 is better but not perfect either. Does someone know what integration "techniques" have been improved in V4 and what kind of integrals it will be better at?

The confidence of my students was really shaken by the above examples, but maybe that was a good lesson.



Raymond Williams:

A good society depends on the free availability of facts and opinions, and on the growth of vision and consciousness — the description of what men have actually seen and known and felt. Any restriction of the freedom of individual contribution is actually a restriction of the resources of society.



Richard Wesley Hamming:

The purpose of computing is insight, not numbers.

Galileo Galilei:

Measure what is measurable, and make measurable what is not so.

Sir Francis Galton:

Whenever you can, count.

VIV - CHANGE TO TOBY (on the right!)

Read full story Jul 15, 2004 comp.soft-sys.math.maple
Toby Bailey, Lack of symbols in the worksheet interface

Is it just me that is totally frustrated by Maple's failure to allow at least basic maths symbols (like e.g. "subset") in the text sections of worksheets?

It seems mad to me that so much effort has been put into enabling us to make worksheets look pretty and to document them when you can't use the most basic normal maths notation in the comments.

It would be very easy to do (it doesn't have to be LaTeX - just a couple of fonts of basic symbols would do). They should also allow us IN MATHS TEXT to write b>a without converting it to a<b.

I would really like to produce some partially interactive lecture notes using Maple but currently it is impossible.

It is clear the situation is absurd when Maple's own Maths dictionary has to use imported graphics to give examples of notation under "subset".

Read full story Feb 2, 2003-02-02 comp.soft-sys.math.maple
Helmut Jarausch, OMMO (one more Maple's oddity)

Maple appears to me as one of the hardest to use software systems I know of.

Why does the VectorCalculus package override the basic 'int' command in such an incompatible way?

How can I get rid of the VectorCalculus package short of doing a complete restart?

It's hard to me to recommend such a package to young students.

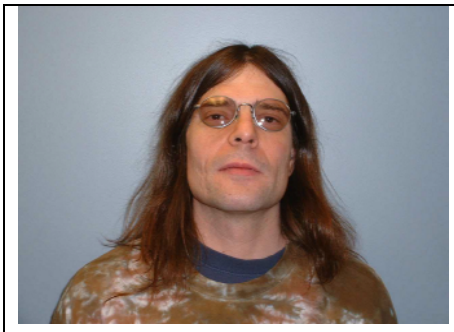
I fear, I have to learn Mathematica's surprises, as well.

Priv.-Doz. Dr. Helmut Jarausch, AOR

Read full story Feb 2, 2003-02-02 comp.soft-sys.math.maple
Helmut Jarausch, OMMO (one more Maple's oddity)

I really would appreciate if you or someone else writes up something under the title
'common Maple pitfalls and how to circumvent them'.

Meanwhile I have 3 books on Maple but none fulfills this gap.

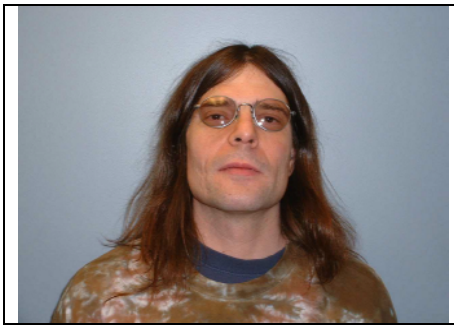


Read full story Oct 16, 2003 comp.soft-sys.math.maple
Carl Devore, Re: Why it's doing so?

I think that marketing people (not just at Maplesoft) believe that it is easier to sell new features (known in the marketing lingo as "bells and whistles" I believe) than sell people on the fact that old bugs have been corrected. So there has been an explosion of bells and whistles on Maple in the past few years.

http://www.jargon.net/jargonfile/b/bellsandwhistles.html

bells and whistles /n./ Features added to a program or system to make it more flavorful from a hacker's point of view, without necessarily adding to its utility for its primary function.



Read full story Oct 16, 2003 comp.soft-sys.math.maple
Carl Devore, Re: Why it's doing so?

I don't think he [Robert Israel] was being sarcastic. There have been papers written (by Eugenio Roanes Lozano) detailing how a CAS could be used for train- traffic control. But I wouldn't use Maple or any commercial CAS for such an application. I would use a small, dedicated program, after extensive peer review and testing.

Eugenio Roanes-Lozano, Luis M. Laita, Eugenio Roanes-Macías: An Application of an AI Methodology to Railway Interlocking Systems Using Computer Algebra. IEA/AIE (Vol. 2) 1998: 687-696

Read full story Oct 16, 2003 comp.soft-sys.math.maple
Carl Devore, Re: Why it's doing so?

GUI bugs are a totally worthless nuisance, especially when they make it crash and you lose your work.

Read full story

From: Thomas D. Dean (tomdean@speakeasy.net)
Subject: Silly Answer from Maplesoft
Newsgroups: comp.soft-sys.math.maple
Date: 2003-11-10 07:51:51 PST

```
I received a silly answer from Maplesoft in response to a simple problem.  Seems
```

like they did not read my problem report.

I have Maple9 installed and running. I attempted to upgrade to 9.02

The dopwnload and installation seemed to go OK.

tomdean

...
From: "Support (WM Support)" <Support@maplesoft.com>
...
Dear Thomas Dean,

Thank you for contacting Maplesoft. Your message follows:

~~~~~~
Linux emulation under FreeBSD.

Downloaded and Installed 9.02. About shows version 9.01,
July 9 2003, Build ID 137227.

...
~~~~~~

Maple 9 is not supported on FreeBSD Linux. At this time, we currently do not
have any plans to release Maple for the FreeBSD operating system.

Sincerely,
Technical Support Department
Maplesoft
www.maplesoft.com/support

	Read full story From: Carl Devore (devore@math.udel.edu) Subject: Re: Silly Answer from Maplesoft Newsgroups: comp.soft-sys.math.maple Date: 2003-11-10 23:58:32 PST "Thomas D. Dean" <tomdean@speakeasy.net> wrote: > I received a silly answer from Maplesoft in response to a simple problem. > Seems like they did not read my problem report. This answer that you got from Maplesoft is ridiculuous. Either the person answering the email is unqualified to do so, or the official policy is that if you mention an unsupported OS anywhere in your email then they will not help you even when your problem has nothing to do with OS. I'd like to know which.

Read full story

From: Frederique & Herve Sai nct (h.sainct@laposte.net)
Subject: Re: Silly Answer from Maplesoft
Newsgroups: comp.soft-sys.math.maple
Date: 2003-11-11 02:27:15 PST

Thomas D. Dean <tomdean@speakeasy.net> wrote:

> ~~~~~~
> Linux emulation under FreeBSD.
>
> Downloaded and Installed 9.02. About shows version 9.01,
> July 9 2003, Build ID 137227.

FYI, the same happens with my upgrade on OSX...

Herve

Read full story

Date: Tue, 2 Jan 2001 08:53:15 -0700
To: maple-list@daisy.uwaterloo.ca
From: Alain Goriely <goriely@math.arizona.edu>
Subject: JacobiSN is wrong?

A couple years ago, I wrote a paper in classical mechanics and we produced a lot of graphs with Maple 5.1 using elliptic and Jacobi functions (we checked them independently).

Recently, I tried to use **the same program** with Maple 6.0 and got **completely wrong results.**

For instance (the example form the help menu) in Maple 5.1

```
> JacobiSN(1.0,(0.5));

 .8226355779
```

This is the right result (verified with Mathematica 4 (that uses JacobiSN(x,m=k^2) and not JacobiSN(x,k)):

```
Mathematica 4:    JacobiSN[1.0, 0.5^2] =0.822636
```

BUT in Maple 6.0

```
> JacobiSN(1.0,(0.5));

   .9219859263
```

```
JacobiAM(EllipticF(sin(phi),k),k) = phi
```

it works fine in (Maple 5.1):

```
> JacobiAM(EllipticF( sin(1.23456789),0.5),0.5);

  1.234567890
```

BUT IN MAPLE 6.0

```
> JacobiAM(EllipticF(sin(1.23456789),0.5),0.5);

1.368202834
```

THIS IS A VERY SERIOUS MISTAKE for anybody using Maple for professional purpose.

IT SHOULD BE FIXED AS SOON AS POSSIBLE. **We pay a lot of money for upgrades** that have

nice GUI and other functions but the stability of Maple for the evaluation of elementary and special functions is a cornerstone of its power and use.

Prof. A. Goriely
Department of Mathematics, bldg#89,
University of Arizona, Tucson, AZ85721
http://www.math.arizona.edu/~goriely

Read full story

From: TANGUY Christian FTRD/RTA/BAG <christian.tanguy@rd.francetelecom.fr>
Subject: [MUG] Re: Bug?
Date: Wed, 31 Jan 2001 16:50:15 +0100

| >> From: "Support (WM Support)" Support@maplesoft.com

| This problem results from a bug in Maple when parsing integers. This bug does not
| affect computationally generated integers. On 32-bit machines (as determined by
| kernelopts(wordsize)) it happens when the first 10 digits of an integer are either
| 2147483648 or 2147483649. On
| 64-bit machines it happens when the first 19 digits are
| 9223372036854775808 or 9223372036854775809.

Looks like the Pentium bug to me. For people making even a modest use of formal/integer calculations (for such trivial stuff as Taylor series, for instance...), Maple 6 must currently be considered as utterly unreliable. The increasing number of ther bugs, which did NOT appear in the preceding versions 4 and 5.1, is also cause for deep worry. Let me mention the recent posting on JacobiSN function, by Prof. Alain Goriely (Date: Tue, 2 Jan 2001 08:53:15 -0700). I entirely agree with Prof. Goriely when he wrote:

"THIS IS A VERY SERIOUS MISTAKE for anybody using Maple for professional purpose.
IT SHOULD BE FIXED AS SOON AS POSSIBLE. We pay a lot of money for upgrades that have nice GUI and other functions but the stability of Maple for the evaluation of elementary and special functions is a cornerstone of its power and use."

All this made me look back at some worksheet of mine (September 29, 2000; Maple 6, NT 4.0, PII 333, 128 Mo), which gave some weird answer when I tried to solve a system of equations. I failed to realize then that something was deeply wrong; I incorrectly attributed this mistake to a badly (re)defined variable or to an error of mine. (Many thanks to D. Frenkel and R. Portugal for pointing out this bug!) Here it is: I wanted to solve a differential equation, which led to:

```
> g71 :=
(-33/4194304+60*e15)*x^14+(56*e14-225*e15-991/8388608)*x^13+(-30029/33554432
-196*e14+52*e13)*x^12+(-611507/134217728-169*e13+48*e12)*x^11+(-144*e12-1871
9535/1073741824+44*e11)*x^10+(40*e10-121*e11-56916329/1073741824)*x^9+(-100*
e10-1131621087/8589934592+36*e9)*x^8+(-4654640715/17179869184+32*e8-81*e9)*x
^7+(-126696595713/274877906944+28*e7-64*e8)*x^6+(-352910740203/549755813888+
24*e6-49*e7)*x^5+(-36*e6-1560337031337/2199023255552+20*e5)*x^4+(16*e4-52646
58865647/8796093022208-25*e5)*x^3+(-15793976596941/70368744177664+12*e3-16*e
4)*x^2+(8*e2-9*e3)*x+epsilon7-4*e2;
```

I was looking for the ei's plus epsilon7 such that g71 is identically zero for all x's. At some point, I decided to solve it step by step, which led to:

```
> solutions2 :=
{e15=33/4194304/60,e14=2477/16777216/56,e13=5921/4194304/52,e12=1227291/1342
17728/48,e11=48174519/1073741824/44,e10=757585025/4294967296/40}:
g72b := subs(solutions2,g71);
g72b := (-1229886553/2147483648+36*e9)*x^8 + ...
> solve(-1229886553/2147483648+36*e9,e9);
-1229886553/77309411328
```

Not only is the sign incorrect, but the absolute value is no good either:
Indeed the cursed 2147483648 appears. Since e9 is false, all the following
ei's are false too. **I don't know what to think of the statement of Support,
claiming that "This bug does not affect computationally generated integers".**

I cannot, unfortunately, divine and even less control when the "magic" integers will
appear in any calculation. My advice, for the time being, is therefore to avoid Maple 6
in formal computations and to use instead Maple V 5.1 or/and the well-known competitor.

Finally, I would like to ask two questions:

1) **Will Maplesoft send a FREE REPLACEMENT to all registered users of (buggy)
Maple 6 (following Intel's policy a few years ago), AND HOW SOON?**

2) **If the answer to 1) is negative, has a refund policy been considered?**

Thank you for your consideration,
CT

Read full story May 16, 2001 MUG
Josef Hekrdla, [MUG] elementary integration failed

bug in integration in Maple 6 and fix (16.5.01)

I am really horrified! If you integrate elementary function 1/(9x^2+6x+2), you obtain the wrong result arctan(1+3x) instead of the correct 1/3*arctan(1+3x)! It is only for Maple6. Maple5 returns the correct result.

Date: Fri, 18 May 2001 03:43:45 -0400 (EDT)
From: Carl DeVore <devore@math.udel.edu>
To: maple-list@daisy.uwaterloo.ca, hekrdla@math.feld.cvut.cz
Subject: elementary integration failed

This bug results from trying to program a great variety of simple cases rather than just using a handful of algorithms for the general cases. In this problem, the special case that is handled in procedure `int/ratpoly/ratpoly` is when the denominator is exactly one more than a perfect square of first-degree binomial. In other words,

> int(c/((a*x+b)^2+1), x)

will give the wrong answer. Change that 1 to anything else and you'll get the right answer. This case is so special -- why do they even bother with it? It's hard to imagine that it is worth the bother to treat it separately.

The general case algorithms need to be there anyway. Does it really save that much time to sort out and handle the simple cases? When there are so many special cases, it makes it that much more likely that a trivial bug will go undetected for a long time. Does Maple have an official programming philosophy?

In this case, the bug is truly trivial -- essentially a typo -- and easy for the user to correct. The fact that someone did not notice this bug sooner is a sign that it is not worth the trouble to treat this case separately. I've traced it to lines 21 and 23 of procedure `int/ratpoly/ratpoly`. I show the fix after the code below.

```
> restart;
> showstat(`int/ratpoly/ratpoly`);

`int/ratpoly/ratpoly` := proc(f)
local ans, den, num, d, n, k, const, q, r, rest, g, const2, A, B, answer;
  1   if type(f,polynom(anything,_X)) then
  2     RETURN(`int/polynom`(args))
      end if;
  3   if type(f,`+`) then
  4     return map(procname,f)
      end if;
  5   num := 1;
  6   const := 1;
  7   if type(f,`*`) then
  8     rest, const := selectremove(has,f,_X);
  9     num, den := numer(rest), denom(rest)
      else
 10     const, num, den := 1, 1, denom(f)
      end if;
 11   den, n := op(`if`(den::`^`,den,[den, 1]));
 12   d := degree(den,_X);
 13   answer := FAIL;
 14   if d = 1 then
 15     const := const*num/coeff(den,_X,1);
 16     if n = 1 then
 17       answer := const*ln(den)
       else
 18       answer := -const/(n-1)/(den^(n-1))
       end if
      elif n = 1 and degree(num,_X) = d-1 and rem(num,diff(den,_X),_X,q) = 0 then
 19     answer := const*q*ln(den)
      elif n = 1 and d = 2+2*degree(num,_X) and type(den,polynom(polynom(rational),_X)) and psqrt(den-
1) <> _NOSQRT and rem(diff(den-1,_X),num,_X) = 0 then
 20     r := psqrt(den-1);
 21     answer := const/content(r,_X)*arctan(r)
                  ^^^^^^^^^^^^^
```

The bug is that they divide by the common factor (the "content") of the binomial rather than by its leading coefficient.

```
      elif n = 1 and d = 2+2*degree(num,_X) and type(den,polynom(polynom(rational),_X)) and
psqrt(den+1) <> _NOSQRT and rem(diff(den+1,_X),num,_X) = 0 then
 22     r := psqrt(den+1);
 23     answer := const/content(r,_X)*arctanh(r)
```

```
                ^^^^^^^^^^^^^
```

Same bug here.

```
    elif d = 2 then
 24   answer := const*`int/ratpoly/quadratic`(num,den,n-1)
    elif d = 3 then
 25   r := `int/ratpoly/cubic`(num,den,n);
 26   answer := `if`(r = FAIL,FAIL,const*r)
    elif 0 < ldegree(num,_X) and `int/ratpoly/subs`(num,den,'k') then
 27   num := collect(num/(_X^(k-1)),_X);
 28   r := `int/indef1`(subs(_X = _X^(1/k),num/(den^n)));
 29   answer := 1/k*const*subs(_X = _X^k,r)
    elif irem(d,2,'q') = 0 and degree(num,_X) = q-1 and `int/ratpoly/arctan`(num,den^(n+1),'q') then
 30   answer := const*q
    elif d = 4 then
 31   r := `int/ratpoly/quartic`(num,den,n);
 32   answer := `if`(r = FAIL,FAIL,const*r)
    elif d = 5 then
 33   r := `int/ratpoly/quintic`(num,den,n-1);
 34   answer := `if`(r = FAIL,FAIL,const*r)
    elif d = 6 then
 35   r := `int/ratpoly/sextic`(num,den,n-1);
 36   answer := `if`(r = FAIL,FAIL,const*r)
    end if;
 37  if answer = FAIL then
 38   if type(f,'ratpoly(rational,_X)') then
 39     const*`int/risch/ratpoly`(num/(den^n),_X)
      else
 40     g, const2, A, B := `int/ratpoly/horowitz`(num/(den^n),_X);
 41     if A = 0 then
 42       const*g
       else
 43       const*(g+const2*sum(subs(_X = _R,A/diff(B,_X))*ln(_X-_R),_R = RootOf(B,_X)))
       end if
      end if
    else
 44   answer
    end if
end proc
```

An example of the bug in action:

```
> int(c/((a*x+b)^2+1), x);

                      c arctan(a x + b)
```

Before you test my fix, make sure to do a restart to clear the erroneous answers from the remember tables.

```
> restart;
```

Since the "content" command is used only on the erroneous lines, you can easily correct this bug:

> `int/ratpoly/ratpoly`:= subs(content= lcoeff, eval(`int/ratpoly/ratpoly`)):

You could also use "diff" instead of "lcoeff". That would be more natural.

Test it:

> int(c/((a*x+b)^2+1), x);

$$\frac{c \arctan(a x + b)}{a}$$

> int(1/(9*x^2+6*x+2), x);

$$1/3 \arctan(1 + 3 x)$$

In release 5, these special cases are not treated. They are merely passed on to `int/ratpoly/quadratic` as in line 24 above. Why were these cases singled out in release 6?

I am not absolutely sure that my fix works in all cases. Be wary when doing integrals with a quadratic denominator.

Carl Devore
University of Delaware

	Read full story Nov 30, 2000 sci.math.symbolic Jürgen Barsuhn, Re: Long comments on: Symbolic computation and strong typing Many people wish to use computer algebra systems without having a background knowledge of algebra, so they simply are not aware in which ring or field (whether algebraically closed or not) they are performing their everyday computations. It appears to me that many mathematicians just do not know that such people exist and even are able to survive for a limited period of time.

> Int(f(x),x = 0 .. 1); $\int_0^1 f(x)\,dx$ Int(f(x), x = 0 .. 1) Int(f(x), x = 0 .. 1) > Int(f(x),x = 0 .. 1); > Int(f(x),x = 0 .. 1);	$\int_0^1 f(x)\,dx$ Int(f(x), x = 0 .. 1) Int(f(x), x = 0 .. 1)

	Henry Ford: If you think you can or think you can't you're probably right.

	Samuel Johnson: Sir, I have found you an argument. I am not obliged to find you an understanding.

	Sir Arthur Conan Doyle: From a drop of water a logician could predict an Atlantic or a Niagara.

	Albert Einstein: Everything should be made as simple as possible, but not simpler.

	Albert D. Rich Small is Beautiful.

	René Descartes: Each problem that I solved became a rule which served afterwards to solve other problems.

	William H. Gates III: I can do anything I put my mind to.

	Jean Le Rond D'Alembert: Just go on... and faith will soon return.

	Neils Bohr: Prediction is very difficult, especially about the future.

	Louis Pasteur: Let me tell you the secret that has led me to my goal. My strength lies solely in my tenacity.

	Raymond Chandler: Technique alone is never enough. You have to have passion. Technique alone is just an embroidered potholder.

	Italian Proverb: By asking for the impossible we obtain the best possible.

	Carl Jacobi: Man muss immer generalisieren.

	Aristotle: The whole is more than the sum of its parts.

	Niels Henrik David Bohr:

	An expert is a man who has made all the mistakes, which can be made, in a very narrow field.

Your Majesty, Your Royal Highnesses, Ladies and Gentlemen.

The work I have done has, already, been adequately rewarded and recognized.

Imagination reaches out repeatedly trying to achieve some higher level of understanding, until suddenly I find myself momentarily alone before one new corner of nature's pattern of beauty and true majesty

revealed. That was my reward.

Then, having fashioned tools to make access easier to the new level, I see these tools used by other men straining their imaginations against further mysteries beyond. There, are my votes of recognition.

Then comes the prize, and a deluge of messages. Reports; of fathers turning excitedly with newspapers in hand to wives; of daughters running up and down the apartment house ringing neighbor's doorbells with news; victorious cries of "I told you so" by those having no technical knowledge - their successful prediction being based on faith alone; from friends, from relatives, from students, from former teachers, from scientific colleagues, from total strangers; formal commendations, silly jokes, parties, presents; a multitude of messages in a multitude of forms.

But, in each I saw the same two common elements. I saw in each, joy; and I saw affection (you see, whatever modesty I may have had has been completely swept away in recent days).

The prize was a signal to permit them to express, and me to learn about, their feelings. Each joy, though transient thrill, repeated in so many places amounts to a considerable sum of human happiness. And, each note of affection released thus one upon another has permitted me to realize a depth of love for my friends and acquaintances, which I had never felt so poignantly before.

For this, I thank Alfred Nobel and the many who worked so hard to carry out his wishes in this particular way.

And so, you Swedish people, with your honors, and your trumpets, and your king - forgive me. For I understand at last - such things provide entrance to the heart. Used by a wise and peaceful people they can generate good feeling, even love, among men, even in lands far beyond your own. For that lesson, I thank you. Tack!

You're not REALLY a safe cracker, are you, Mr. Feynman?

Maple bugs cornucopia (ms)

I cannot imagine any condition which would cause a ship to founder.... Modern shipbuilding has gone beyond that.

-- Edward J. Smith, captain of the Titanic

http://www.historyonthenet.com/Titanic/blame.htm

Shortly before the explosion of the Challenger space shuttle, Bryan O'Connor, nasa's Washington-based director of the shuttle program, recalls that he "asked someone what the probability risk assessment was for the loss of a shuttle. I was told it was one in ten thousand."

I asked someone what the probability risk assessment was for the loss of a shuttle. I was told it was 1/10,000. There was no study.

Bryan O'Connor, the NASA shuttle program director.

http://www.chron.com/content/chronicle/page1/96/01/21/shuttle.html - 10 years after Challenger, NASA feels shuttle safety never better

On Maple test bed

SACRIFICING CUSTOMER'S SAFETY FOR THE SAKE OF PROFITS ?

http://mathforum.org/epigone/sci.math.symbolic/craytheireld

Subject: --> Uncensored Maple Bugs <--
Author: Vladimir Bondarenko <vb@cybertester.com>
Date: 14 Jun 04 05:25:36 -0400 (EDT)

```
  ******************************
  ***  MAPLE BUGS UNCENSORED  ***
```

****

The materials which are available within this site may include graphic visual depictions and descriptions of MAPLE BUGS and MAPLE BOTTLENECKS and should NOT be accessed by anyone who is younger than 18 years old or who does not wish to be exposed to such materials, or ever bother themselves about such stuff at all as expert V&V might be high-priced (e.g. Keith Geddes www.scg.uwaterloo.ca/~kogeddes/ the Maplesoft owner and/or top Maplesoft officers).

By entering this site you are making the following explicit statement: Under penalty of perjury, I swear and affirm that as of this moment, I am an adult, at least 18 years of age, and can tell what is sqrt(4) or, at least, in the long run, being given a extensive pointer, gabble out what makes 2+2.

Promise that I will not permit any person(s) under 18 years of age especially those, including but not limited to freshmen and sophomores, with poor or abominable math knowledge to have access to any of the materials contained within this site.

Understand that when I gain access to this site, I will be exposed to visual images and verbal descriptions of extended, detailed, hard-core Maple bugs demystified and shown as large as life graphs, formulas, bar charts of frankly math-oriented nature, which may include graphic visual depictions and/or descriptions of both the most notorious and petty Maple bugs including but not limited to, crashes, blatant errors and howlers, invalid mathematical answers, erroneous divergencies and false convergencies, ubiquitous side effects and/or extensive erratic behaviors, meaningless answers, towering slowdowns and freezes, help inconsistencies, lacunas and typos, because I want to view and/or read various materials which are available, for my own personal enjoyment, information and/or education, and making decision on should I acquire Maple from Maplesoft, a colossus with clay feet.

ENTER MAPLE BUGS ENCYCLOPAEDIA
http://maple.bug-list.org/

LEAVE MATH HORROR IMMEDIATELY!
http://www.derive.com/

we have 25 free guest passes available on a first-come-first-served basis.

contrary to TANSTAAFL ("There ain't no such thing as a free lunch"), the pass does indeed include a free lunch.

Main Results

29. Maple 9.5 is an unstable, inconsistent, non-linear, non-uniform, randomized, self-incompatible environment where fundamental math properties (uniqueness of the answer for a good-defined problem, commutativity & linearity property etc) now hold now fail in a random fashion, thus Maple breaks down grotesquely.

30. Surprisingly, success achieved by Waterloo Maple/Maplesoft is achieved rather by chance than by planning.

31. Up to this time, a ridiculously low fraction of Maple bugs, at best 2-3%, has been reported ever publicly.

32. Waterloo Maple/Maplesoft does not fix publicly known bugs since 1998 (!)

33. Officially introduced features, systematically, do NOT works as it is claimed in Help. Also, Maple is raw, it often cannot follow the given task to its logical end.

34. In the version x+1 Maplesoft *invariably* breaks tangibly the functionality that worked well in the version x.

35. There exists something like the swing of the tides in propagation of Maple bugs over versions.

36. Maple 9.03/9.02/9.01/9 are in fact beta release candidates sold by Maplesoft under the claim they are, and at the price of, commercial releases.

37. There are at least thousands regression bugs in Maple.

38. There are at least hundreds recurring regression bugs in Maple.

39. Reproducible instability exists in Maple at least since 1994.

40. Since Maple 8, Maple is getting more and more instable reproducibly.

41. There is irreproducible documented/recorded instability.

42. Solutions found by Maple are often partial; in other words, unlike its competitors, Maple does not find all solutions.

43. Maple cannot use its own resources efficiently.

44. Maple uses obsolete, inefficient algorithms.

45. Command line and the GUI versions produces *different mathematical results* since at least 1997.

46. Maple bugs are ubiquitous; the customer can encounter a bug even in a 'simple', 'obvious' functions like / (division), define(), type(), whattype(), print(), printf(), lprint(), version(), cpulimit(), euler(), plot(), DEplot(), densityplot(), ellipse(), inequal(), coeff(), coeffs(), residue(), subs(), convert(), changevar(), eliminate(), pade(), combinat() etc.

47. There are thousands undocumented features, according to Maple experts.

48. Maple makers do not know how to or in any case do not want to use a spellchecker.

49. Summing up, since some 2002, Maple is getting more and more user-hostile.

50. Maplesoft quality assurance group's activity is blocked or inadequate, in any case, it is inefficient.

51. Maplesoft is increasingly loosing control over Maple development.

52. There are lasting severe decision making problems in the top Maplesoft's management staff.

53. During the last decade, a user-centered Maple development model evolved gradually into a revenue-centered Maple development model, which represents a direct threat to the very existence of Maplesoft.

54. Had immediate actions are not taken, Maplesoft is running the risk of loosing its market share increasingly.

http://groups.google.com/groups?hl=en&lr=&safe=off&selm=2kij26%248cc%40senator-bedfellow.MIT.EDU

From: Reid M. Pinchback (reidmp@athena.mit.edu)
Subject: Re: Maple's "cracks"???
Newsgroups: sci.math.symbolic
Date: 1994-02-26 13:12:52 PST

View this article only

```
In article <CLowuE.2BG@gpu.utcc.utoronto.ca>, pindor@gpu.utcc.utoronto.ca (Andrzej
Pindor) writes:
>>Thanks for bringing this to our attention.  I promise that it will
>>be fixed for the next version.
>>
>>Kate
>
>Please DON'T! Such surprises are charming and put 'human' face (;-)) on
>the software (I mean 'do not fix the message'; by all means fix the bug if
>there is one).
>
>Andrzej
>--

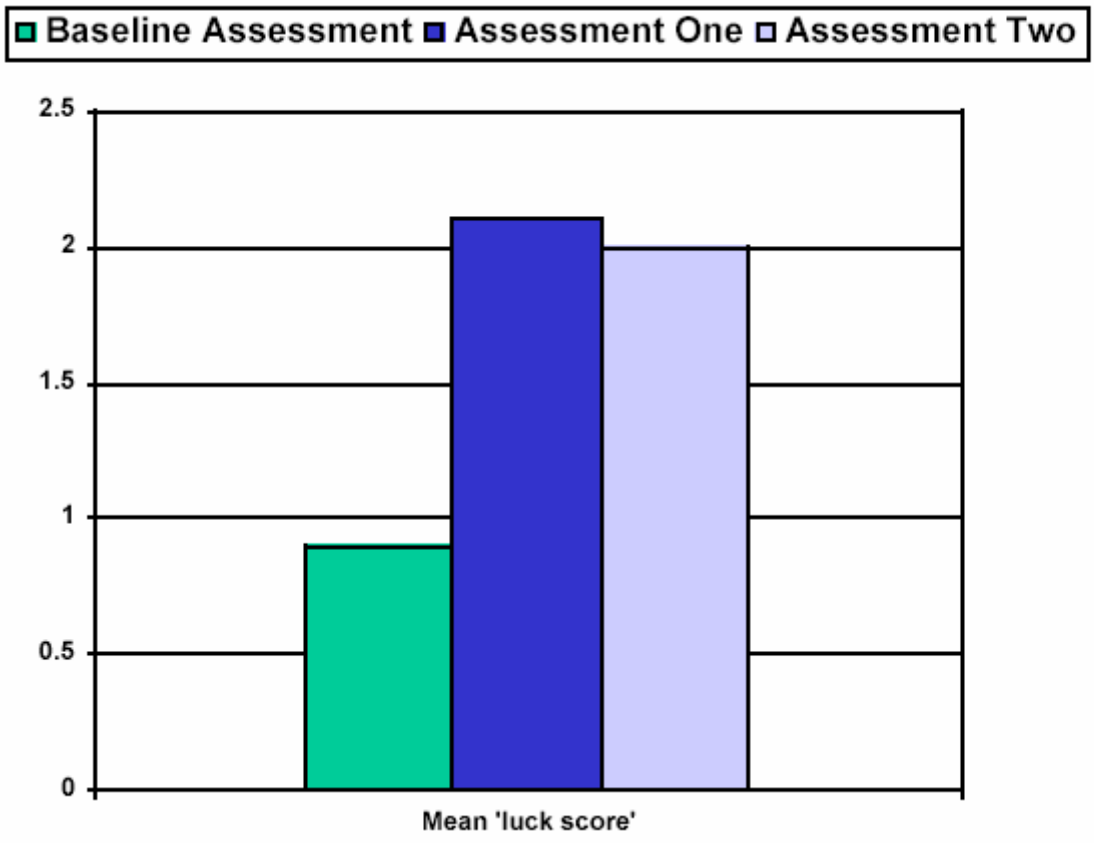
Maybe there should be an interface() setting for levels of humour or
human-ness.  interface(human=-1) could give no error at all, just core
dump.  interface(human=0) could give a frustrating error message with a
meaningless numeric code.  interface(human=1) could give the 'fell through
the cracks' message.  interface(human=2) could give a smiley face and just
say 'Oops!'.

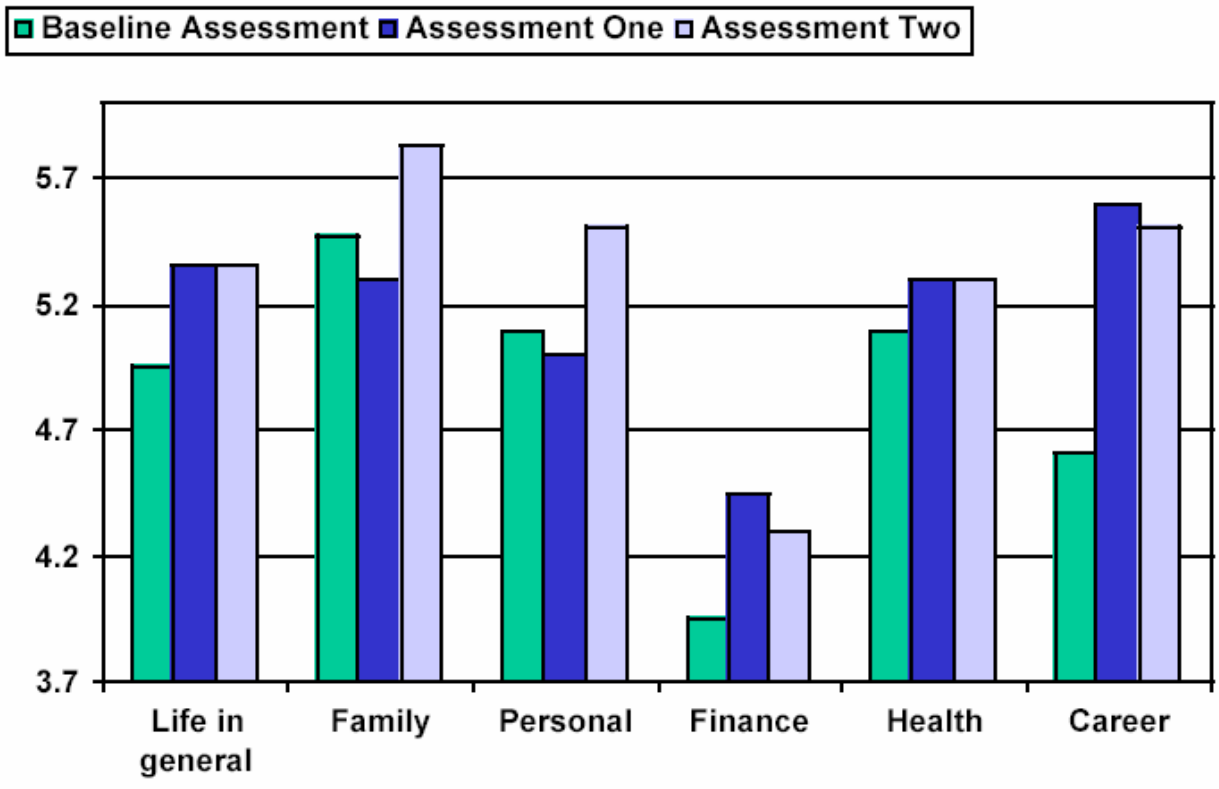
:-)
--
  Reid M. Pinchback
  Faculty Liaison
  Academic Computing Services, MIT
```

Deplorable 10

$_{10}10^{10}$ ^(10^(10^10))

Anyway, a more adequate description of JSH is that he is a genius, although not at mathematics, but at making contributors to sci.math jump through hoops.


Baseline Assessment
Assessment One
Assessment Two
2.5
2
1.5
1
0.5
0
Mean 'luck score'


Baseline Assessment
Assessment One
Assessment Two
5.7
5.2
4.7
4.2
3.7
Life in general
Family
Personal
Finance
Health
Career

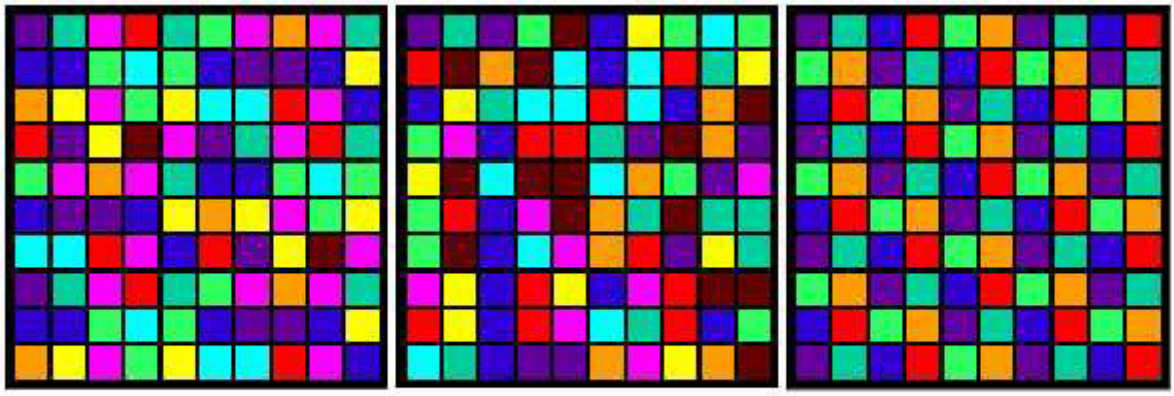


Figure 1.1: A pictorial proof of Archimedes' inequality

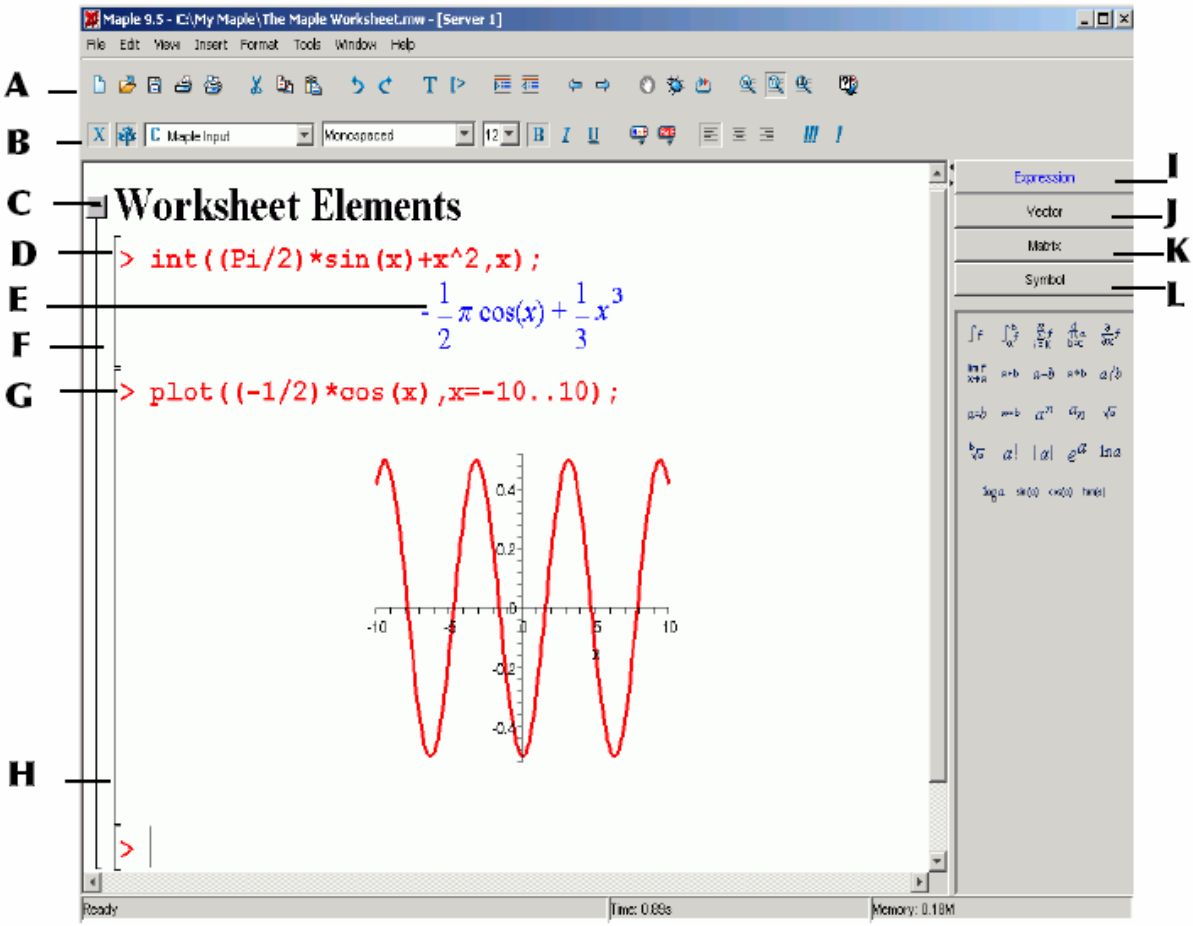


Figure 1-A Maple window features

Table 1: Maple Worksheet Interface

A **Toolbar**
A toolbar containing shortcut buttons.

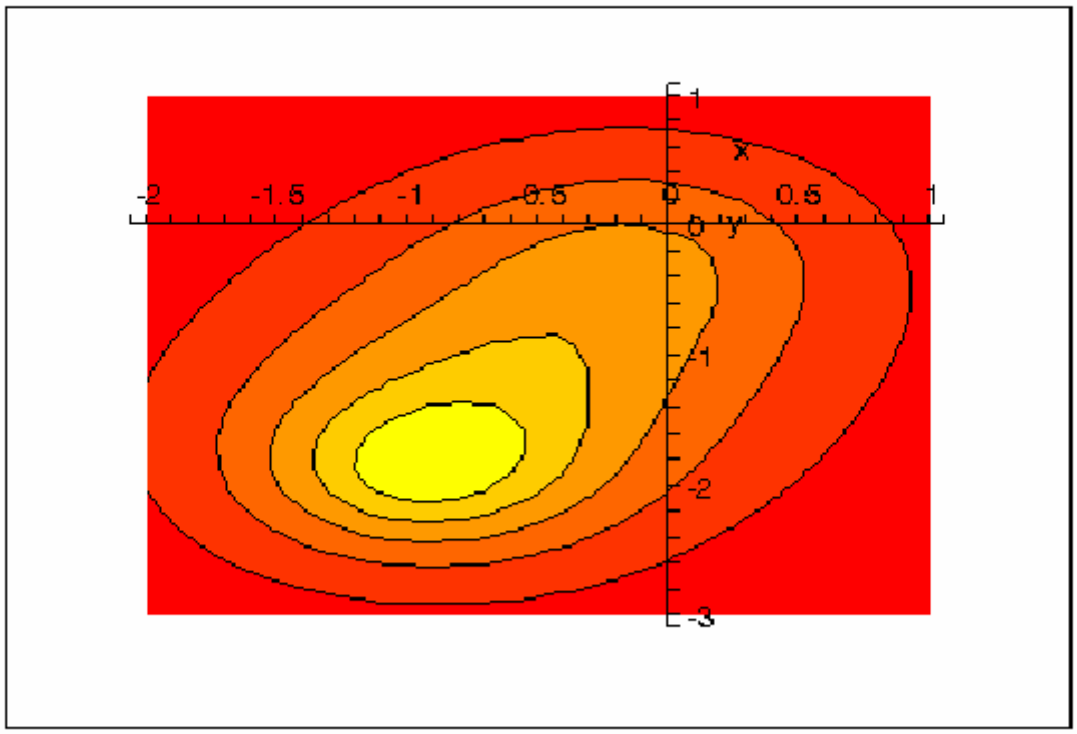
B **Context bar**
A toolbar containing context-sensitive shortcut buttons. (The buttons change based on the cursor location or selection.) It can also contain a field for editing and entering text.

C **Section heading**
The name or title of a section.

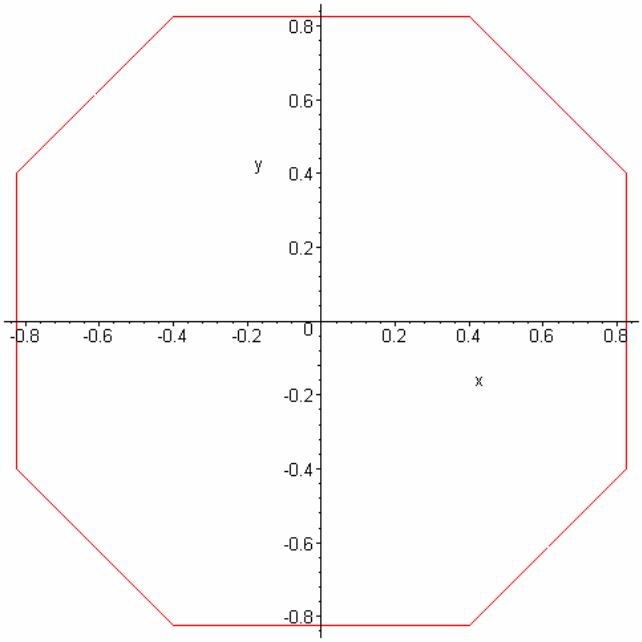
D **Maple input**
A mathematical expression or command that Maple evaluates. By default, input commands are entered at the prompt, ">", and are displayed in red type. The resulting output is displayed beneath.

E **Maple output**
The result of an executed Maple input command. By default, Maple output is displayed in blue type in Standard Math Notation.

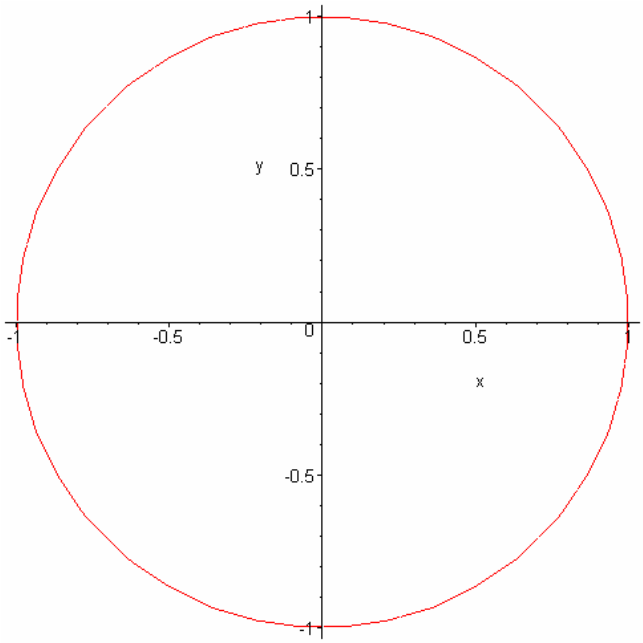
```
contourplot(f, x=-2..1, y=-3..1, contours=5, filled=true);
```



Maple 9.5.1 > **`with(plots): implicitplot(x^2+y^2=1, x=-10..10, y=-10..10);`**



Maple 9.5.1 > **`with(plots): implicitplot(x^2+y^2=1, x=-10..10, y=-10..10, numpoints=20000);`**

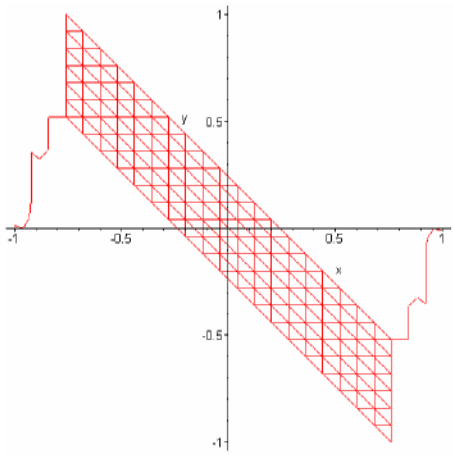


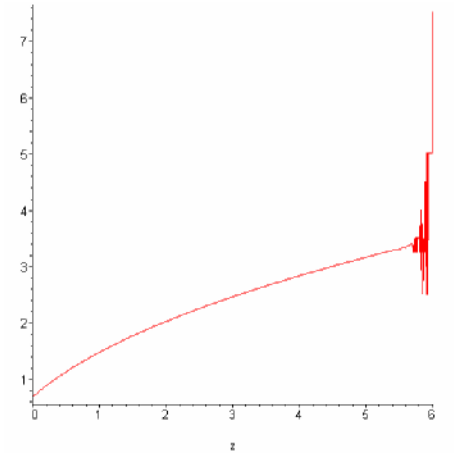
Maple 9.5.1 >

are obtained without any intervention by the user.

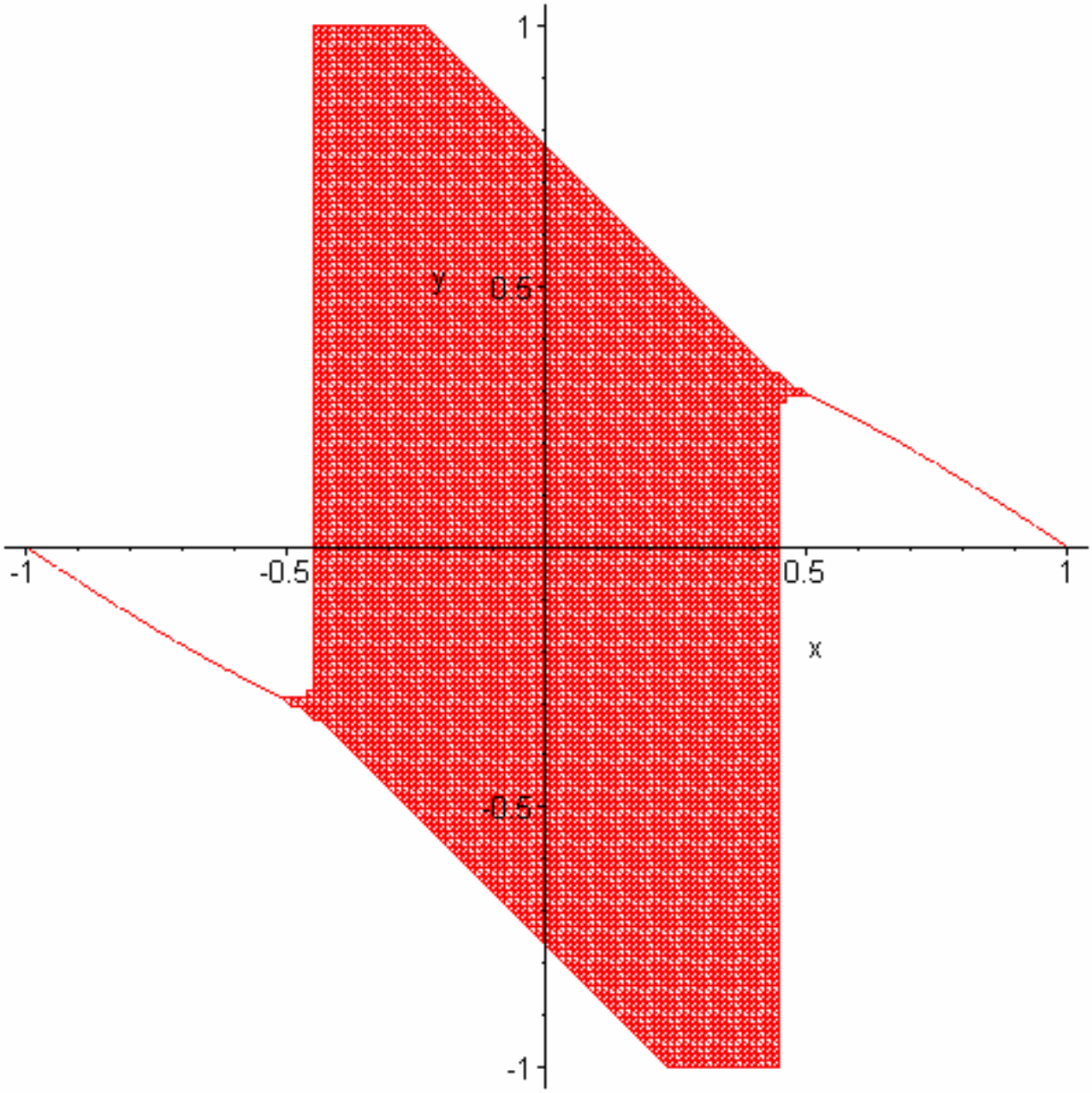
behalf of the staff at Maple

ar 2004. We are looking forw



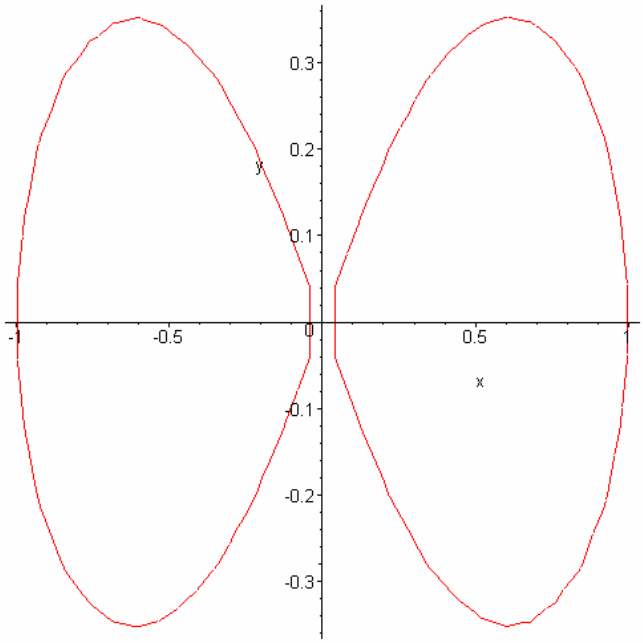



```
> implicitplot(x^11/(x+y)^33 = 1, x=-1..1, y=-1..1, numpoints=20000);
```

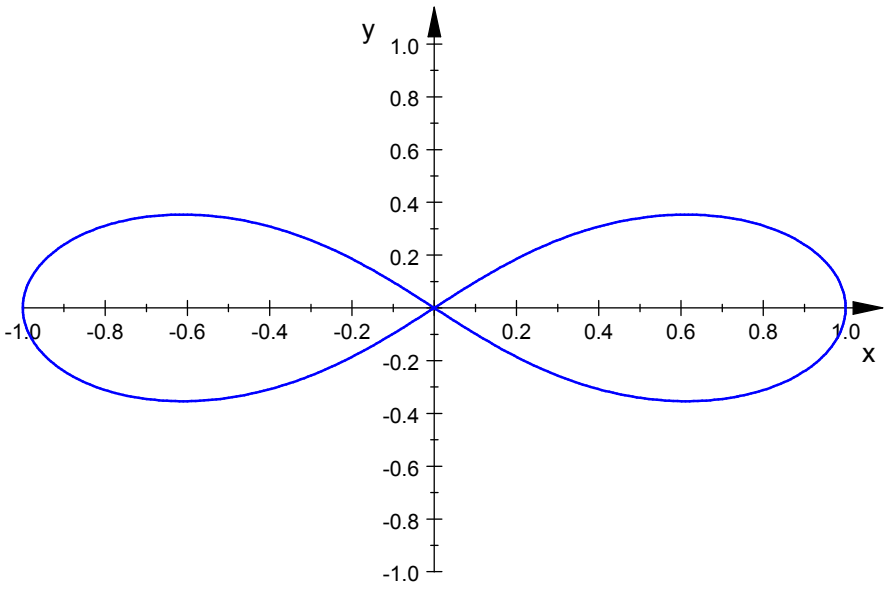

1
y
0.5
-1
-0.5
0.5
1
x
-0.5
-1

>

Maple 9.5.1 >**implicitplot((x^2 + y^2)^2= x^2 - y^2, x=-1..1, y=-1..1);**

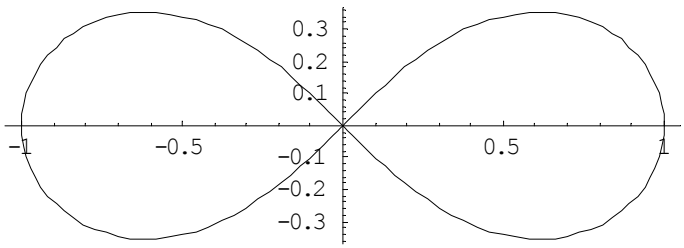


- `plot(plot::Implicit2d((x^2+y^2)^2=x^2-y^2, x = -1..1, y = -1..1))`




```
<<Graphics`ImplicitPlot`

 ImplicitPlot[(x^2+y^2)^2==x^2-y^2,{x,-1,1}]
```



http://groups.google.com/groups?hl=en&lr=&safe=off&selm=34511BF9.794B%40henri.chem.uleth.ca

From: Marc Roussel (roussel@henri.chem.uleth.ca)
Subject: Maple wish list
Newsgroups: sci.math.symbolic
Date: 1997/10/24

View this article only

A week or so ago, I posted a question about the interaction between the Maple assume() facility and the assignment operator :=. (Most of the replies came by email so if you're curious about the solution to my original problem, it is to use assign() instead of := for variables on which assumptions have been made.) One of the responses was from Kelly Roach who, I believe, works for Waterloo Maple Software. He suggested that fixing the problem which gave rise to my question (which is one of those nasty "exported local" problems) was a fairly low priority with the Maple developers. (Kelly, if I'm misrepresenting your position, by all means speak up.)

That started me thinking about the things that I would like to see improved or changed in future releases of Maple. Since I know that some of the Waterloo Maple people read this forum, I thought I would post my wish list here. I would also be curious to see what others think the development priorities should be.

Here's my list:

1. The assume() facility now allows us to do serious mathematics with Maple. I would really, really like to see it completed. To me, that means patching up minor aggravations like the one I described in my previous post. I know that there's a workaround and I use Maple enough to be happy with it, but when I teach students to use Maple in my quantum mechanics course, I don't want to spend all of my time explaining Maple's quirks to them.

2. It would be really, really nice if I could tell fsolve() to look for more than one root of a general equation. In other words, I would like to be able to use the maxsols option to direct Maple to find between 0 and maxsols roots of a general equation. I would also like to be able to use the complex option with general equations. In general, I would like to have more control over what fsolve() does. I might like to pass fsolve() a starting seed instead of a search range. (This would be particularly useful in conjunction with a complex option for nonpolynomial equations.)

3. Again, working with students makes me quite sensitive to the problems of novice Maple users, particularly those who haven't studied a programming language. Many programmer's editors provide some help with delimiter matching. For example vi has a lisp mode which flips briefly to the matching opening delimiter when a closing delimiter is entered, and the % operation which jumps to the matching delimiter or beeps if there isn't one. It would be really nice if Maple's GUI did something to help out with this. An awful lot of the problems students have when carrying out nontrivial computations arise from parenthesis matching. I like what nedit (an Xwindows editor) does when the parenthesis matching option

```
    is on:  The matching delimiter is highlighted for a second
    or so when the closing delimiter is entered.   Maybe the
    Maple developers can look at that as a starting point.
    On a related note, Maple's error messages are good, but
    they could use some work.  It's not always easy to tell
    what has really gone wrong by reading Maple's complaint.

 4. Make the parallel server version the default on
    installation.  People who are used to working with
    spreadsheets expect that bringing up a new sheet will
    clear state.  The behavior of the non-parallel-server
    version mystifies ordinary users and it's not generally
    what they want anyway.

That's all for now.  I'm really curious to see what others will come up
with.

    Marc R. Roussel
    (roussel@uleth.ca)
    Department of Chemistry and Biochemistry
    University of Lethbridge
```

http://groups.google.com/groups?hl=en&lr=&safe=off&selm=bkq8i7%24o61%241%40tabloid.uwaterloo.ca

From: David Hare (deghare@scg.math.uwaterloo.ca)
Subject: Re: Maple 9 shows 0^0 = 1?

View: Complete Thread (18 articles)

```
In article <220920031426464946%ydp4fdr6202@sneakemail.com>,
G. A. Edgar <ydp4fdr6202@sneakemail.com> wrote:
>>
>> It is interesting that Maple defines 0^0 as equal to 1.
>
>Maple is far more interesting than that!
>
>> 0^0;                                1
>> 0^0.0;                       Float(undefined)
>> 0.0^0;                             1.
>> 0^Complex(0.,0.);            Float(undefined) + Float(undefined) I
>> sum(0^k,k=0..5);                   0
>> sum(k^0,k=0..5);                   6
>> product(0,k=2..1); # empty product                          1
>> product(0,k=2..0);
>Error, (in product) numeric exception: division by zero
>
>--
>G. A. Edgar                                 http://www.math.ohio-state.edu/~edgar/
```

```
The basic design is that if the arguments to an operation are floats, then
the rules of analysis generally apply, while if they are integers, the usual
conventions of integer arithmetic apply.  In all cases, the behaviour can be
controlled through the installation of an event handler.

For example, after

> NumericEventHandler(
        invalid_operation = proc(f,x,def)
            if f = `^` and x = [0,0] then
                NumericStatus(invalid_operation=false);
                undefined;
```

```
            else
                def;
            fi;
        end):
```

we have

```
> 0^0;
```

```
                                undefined
```

```
> NumericStatus();
```

```
  invalid_operation = false, division_by_zero = false,

        overflow = false, underflow = false, inexact = false,

        real_to_complex = false
```

```
> infinity^0;
```

```
                                    1
```

```
> NumericStatus();
```

```
  invalid_operation = true, division_by_zero = false,

        overflow = false, underflow = false, inexact = false,

        real_to_complex = false
```

etc. Similarly, singularity events (flagged as "division_by_zero" in Maple) are considered as limits in the complex analytic domain, but errors in the integer domain:

```
> GAMMA(0);
Error, (in GAMMA) numeric exception: division by zero
```

```
> GAMMA(0.);
```

```
                 Float(infinity) + Float(infinity) I
```

Again, one can control this through an event handler for division_by_zero.

This functionality first appeared in Maple 6.

Dave Hare
Senior Developer, Mathematical Software
Maplesoft
deghare@maplesoft.com

http://bernardin.com/maple/index.php

Please report any bug that you encounter (to support@maplesoft.com). Only bugs that we know about will get fixed.

http://bernardin.com/maple/index.php

To assist us in the task of ensuring that what works today will continue to work the next day, we use a large body of automatic tests. Over 96000 test cases are run every night, on all platforms that we support and any failures are analyzed the next morning.

With every new feature that we add and with every bug that we fix, that test suite is growing. In addition, a suite of, today, over 1000 worksheets gathered from users and from the web is run periodically and any discrepancies between releases is looked at to decide if there is a problem or not. Beta testing, with a select group of users, also helps detect problems before a new release. **REALLY? Crashes? Standard?**

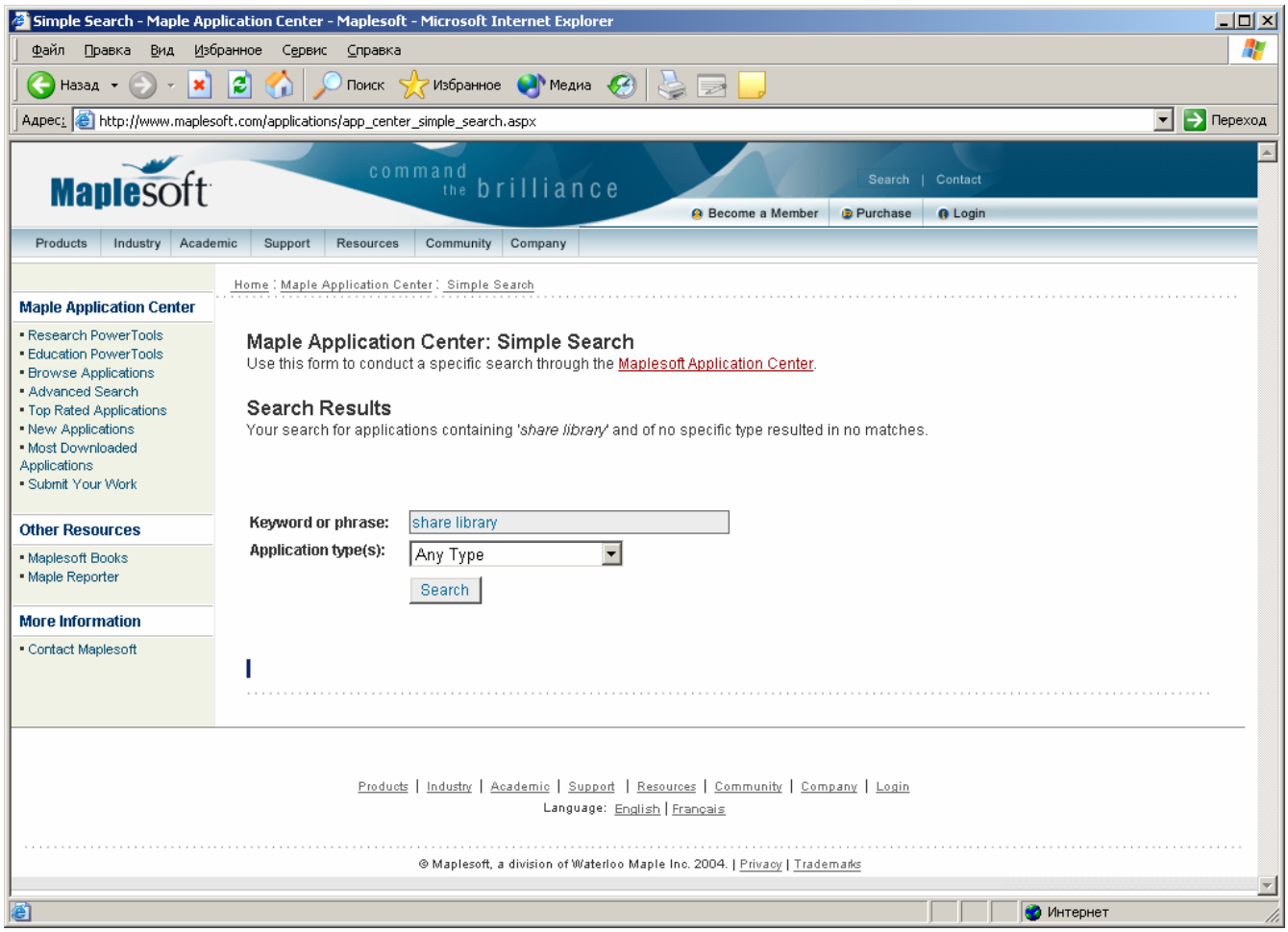
http://www.math.rwth-aachen.de/mapleAnswers/html/754.html

maplesoft committment to the SHARE library? (28.4.99)

Bob Jantzen

Over the years, without really knowing what I was doing, I have retrieved various MAPLE packages that I thought were really useful, but with each new release, it has become more and more difficult for me to stumble through this process successfully.

I am not an expert in these backend details of MAPLE and do not wish to be. The usefulness of software to the vast majority of users is to be able to USE it without having to worry about all these implementation details.



Students across the world rely on Maplesoft products to help with homework and to complete assignments. Moreover, since companies and institutions across the globe rely on Maplesoft to solve engineering and scientific problems, using Maple in your studies is a terrific way to get a head start in your career.

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```
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homework and to complete assignments. Moreover, since companies and
institutions across the globe rely on Maplesoft to solve engineering
and scientific problems, using Maple in your studies is a terrible way
to get a head start in your career.                        ^^^^^^^^
```

ftp://ftp.maplesoft.com/pub/maple/mug/

ftp://ftp.maplesoft.com/pub/maple/mug/Digest.2

```
Return-Path: <maple_group>
Received: by daisy.waterloo.edu
        id <AA16863>; Mon, 1 Oct 90 01:33:41 +0100
Date: Mon, 1 Oct 90 01:33:41 +0100
From: "Maple user group (receiving depot)" <maple_group>
Message-Id: <9010010533.AA16863@daisy.waterloo.edu>
To: maple_group
Subject:  An old bug, already reported, but there might be a message in it?
Status: RO

        From: MATH3019@waikato.ac.nz
        Subject: An old bug, already reported, but there might be a message in it?

I think that Maple is great, but I wonder if it might include
more internal checks on the correctness of some of its answers.

****************************************************************
* The following bug does not appear
* in 4.3 at Canterbury on SUN-SPARC
* in Maple V pre-release on something in Perth, W.BAustralia
****************************************************************

A proposal for more internal checking by symbolic packages of their
indefinite integrals.

Suppose
f is a given function of x,
and a user asks for

ans:=int(f,x);
```

```
(or anything else where an indefinite integral is calculated).

It is suggested that Maple might, after reporting its efforts but
before the next prompt that it is ready for more work, check that

check:=simplify(diff(ans,x)-f)

is independent of x, i.e. is constant as x varies.
If Maple can't see that it is, I would like it to report this fact
to the user.

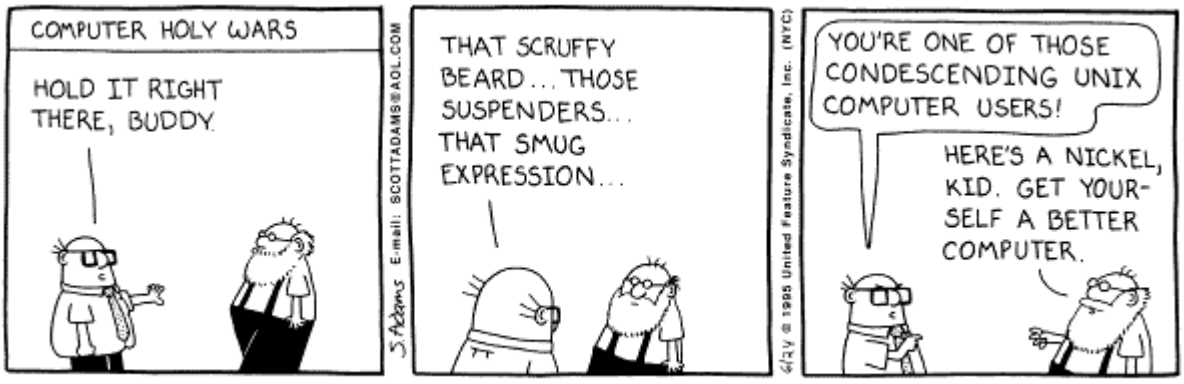
THE BUG IN 4.2.1 Maple (current version for Mac)
f:=((sqrt(x^2-1))/x^4;

Would then show up
                ans:= wrong-answer
      "An internal check indicates that
           check:=simplify(diff(ans,x)-f)
               is not constant."

> (Next prompt to user)

Similarly for o.d.e.s, solve and so on.
A similar check could be made for sums as above for integrals.
This would, presumably catch errors like that I discovered while
trying to do a calculation of Tony Pakes, which he reported,
along with the Maple 4.2 bug in
A.G. Pakes "On a series of reciprocal sums of powers"
Gazette of the Australian Math. Soc. Vol 17 (June 1990), pp61-68.

Grant Keady
Present address: Maths Department, University of Waikato,
                 Hamilton, NZ
        e-mail: math3019@waikato.ac.nz
```



For more

The Dilbert

Odyssey
Dilbert
caveat emptor

1) **лат. да будет осмотрителен покупатель**
2) **юр. ком. качество на риск покупателя**

S
D:\Digest_2.htm

MAPLE BUG: MISSED FUNCTION.

```
Date: Mon, 26 Feb 90 11:24:04 +0100
From: Arne Jensen <matarne@iesd.auc.dk>
Subject: problem with gaussjord

Problem with maple: The function gaussjord from the
linear algebra package is not included, apparently.
It is mentioned in the updates.
Transcript follows

gauss% maple
        |\^/|
    ._|\|   |/|_. Aalborg University
     \  MAPLE  /  Version 4.3 --- Mar 1989
      <____ ____>  For on-line help, type  help();
           |
----------lines deleted--------------
> with(linalg,gaussjord);
                                        []

Error, (in with) gaussjord is not
defined in linalg package
>  help(linalg,gaussjord);

FUNCTION : gaussjord - reduced row echelon form (Gaussian elimination)

 CALLING SEQUENCE :
 gaussjord(A,'rank');

----------lines deleted--------------

Your help is appreciated.
Arne Jensen
return e-mail
matarne@iesd.auc.dk
```

http://www-gap.dcs.st-and.ac.uk/~history/Quotations/Dirac.html

This result is too beautiful to be false; it is more important to have beauty in one's equations than to have them fit experiment.

The evolution of the Physicist's Picture of Nature *Scientific American* **208** (5) (1963)

I think that there is a moral to this story, namely that it is more important to have beauty in one's equations that to have them fit experiment. If Schrödinger had been more confident of his work, he could have published it some months earlier, and he could have published a more accurate equation. It seems that if one is working from the point of view of getting beauty in one's equations, and if one has really a sound insight, one is on a sure line of progress. If there is not complete agreement between the results of one's work and experiment, one should not allow oneself to be too discouraged, because the discrepancy may well be due to minor features that are not properly taken into account and that will get cleared up with further development of the theory.

Scientific American, May 1963.

Gerald Edgar residues

A little further digging reveals that the above **mistake was possibly corrected by Mathematica version 2.2 simply by not doing it**

ö

s
http://groups.google.com/groups?selm=9412140720.AA23588%40VAX1.cmr.ca&output=gplain

```
John Von Neumann once said that floating-point should not be
implemented because users would not be able to judge the precision
of the output. This spectacular example proves him right.
(See "Pitfalls in computation, or why a Math book isn't enough".
                  G.E. Forsythe, Amer. Math. Monthly, nov 1970).

The results below are not weird. Since we live in a finite world,
computer algebra programs such as Maple must at one point round
the intermediate results of computations done in floating point.

The misunderstanding is in the interpretation of .26/.19:
Maple rounds it to 1.368421053 while humans prefer 26/19.

John Von Neumann once said that floating-point should not be
implemented because users would not be able to judge the precision
of the output. This spectacular example proves him right.
(See "Pitfalls in computation, or why a Math book isn't enough".
                  G.E. Forsythe, Amer. Math. Monthly, nov 1970).

(Of course, the real bug here is using rref instead of singularvals,
 and this should not be modified to show how bad the FDIV bug can be).

=======================================================================
> with(linalg): infolevel[linalg]:=3:
> rref( [ [-19/100,26/100], [19/100,-26/100] ] );
rref:   elimination at row   1
rref:   elimination at row   2
                                  [       26  ]
                                  [ 1   - ---- ]
                                  [       19  ]
                                  [           ]
                                  [ 0     0   ]
```

```
> rref( [ [-19./100,26/100], [19/100,-26/100] ] );
linalg/gaussjord/float:   elimination at row   1
linalg/gaussjord/float:   elimination at row   2
                                    [ 1   0 ]
                                    [       ]
                                    [ 0   1 ]

> evalf( -.26+.19*(.26/.19) );
                                         -9
                                    .1*10

> evalf( -.26+.19*evalf(.26/.19, 7), 7 );

                                      0

> interface(verboseproc=2); print( rref );
=================================================================

--
Jacques Ge'linas, Ph.D., Maths,           INTERNET: gelinas@cmr.ca
Colle`ge Militaire Royal de Saint-Jean,
Que'bec, Canada, J0J 1R0.

Have a nice, FDIV bug free, holiday season.
```

Report Number: CS-TR-70-147
Institution: Stanford University, Department of Computer Science
Title: Pitfalls in computation, or why a math book isn't enough
Author: Forsythe, George E.
Date: January 1970
Abstract: The floating-point number system is contrasted with the real numbers. The author then illustrates the variety of computational pitfalls a person can fall into who merely translates information gained from pure mathematics courses into computer programs. Examples include summing a Taylor series, solving a quadratic equation, solving linear algebraic systems, solving ordinary and partial differential equations, and finding polynomial zeros. It is concluded that mathematics courses should be taught with a greater awareness of automatic computation.
ftp://reports.stanford.edu/pub/cstr/reports/cs/tr/70/147/CS-TR-70-147.pdf

http://www-db.stanford.edu/TR/cstr9x.html

Report Number: CS-TR-90-1304
Institution: Stanford University, Department of Computer Science
Title: A model of object-identities and values
Author: Matsushima, Toshiyuki
Author: Wiederhold, Gio
Date: February 1990
Abstract: An algebraic formalization of the object-orlented data model is proposed. The formalism reveals that the semantics of the object-oriented model consists of two portions. One is expressed by an algebraic construct, which has essentially a value-oriented semantics. The other is expressed by object-identities, which characterize the essential difference of the object-oriented model and value-oriented models, such as the relational model and the logical database model. These two portions are integrated by a simple commutativity of modeling functions. The formalism includes the expression of integrity constraints in its construct, which provides the natural integration of

the logical database model and the object-oriented database model.
CS-TR-90-1304

Motivation

The number of internet applications of mathematics software is growing quite dramatically [1,5,7]. Most notably, applications such as scienti_c visualization, distance collaboration, tele-learning, etc., allow users from di_erent backgrounds to share information over the network.

Yet the interfaces remain clumsy, non-user friendly. Even though the provision of a standard protocol and syntax for mathematical input is a remote possibility, users often feel reluctant to learn yet another syntactic convention. One-time visitors, particularly if not computationally inclined or versed, who typically want results immediately, demand a more friendly yet uniform interface.

What better or more natural way of using a new tool than through commands in your own mother tongue? The state of the art in natural language processing is not yet at the point in which it can treat unrestricted text. However, for the restricted domain of mathematics software, we should be able to identify a useful subset of say, English, and a fairly standard way of transforming it into commands of the particular syntax chosen by the software.

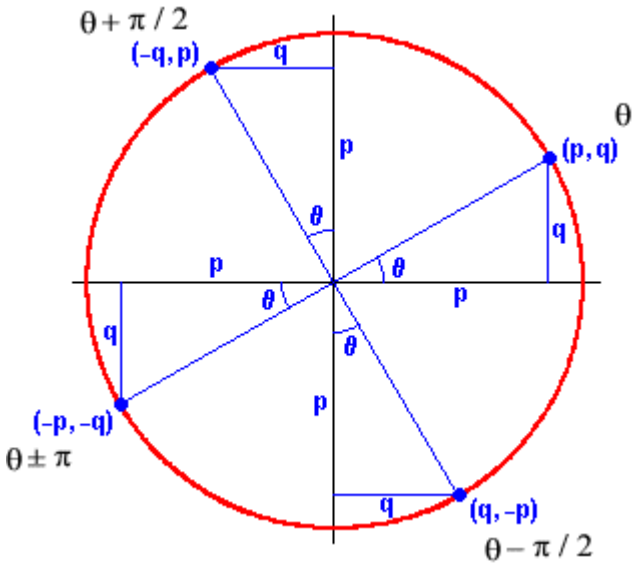
The significance of this research is twofold: on one hand, it enables users to consult mathematics software directly in their mother tongue. On the other hand, it can be of great help to students learning to use the software, who will be able to consult it or command it in English and see the formalized query popping up on the screen as a result. While mathematical software is usually not too di_cult to learn, some of its command syntax and user interface can be discouraging to new-comers. Maple [2], for instance, is particularly wellsuited to aid university freshmen learn calculus through verifying calculations and plotting complicated graphs. However, understanding calculus concepts while learning to use computer program/mathematics software, and picking up Maple syntax, all at once, can be overwhelming for them. What better way of learning a new syntax than through picking its commands up one by one in your own mother tongue?

We motivate the need for more standard while natural ways of accessing the growing number of internet applications of mathematics software. We then identify a subset of natural language appropriate for this task, and describe an e_cient logic programming transformation from this subset of language into the desired commands. We use substructural logic for dealing with di_erent kinds of mathematical anaphora.We exemplify our ideas in the context of Maple, an advanced mathematics software for symbolic computing.

http://mathforum.org/epigone/historia_matematica/prayholay

open-encyclopedia.com

http://www.wmueller.com/precalculus/families/1_71.html



http://jwilson.coe.uga.edu/EMT668/EMT668.Folders.F97/Waggener/Problems/oldtrig/oldtrig.htm

Geometric Proof of a Trigonometric Identity from Ptolemy's *Almagest*

sin(x-y)=sinx*cosy-cosx*siny

Maple should be a Jeeves, not a master

We beforesigned,
Undersigned
Undersigned
We, the undersigned, **declare that**

We, the undersigned, do hereby issue this Proclamation in order to set the record straight:

WE DECLARE that the deliberate cold-blooded killing of a

WE DECLARE that the pro-life movement acknowledges that every individual human being is created by God in His image and likeness; and

WE DO HEREBY PROCLAIM THAT IT IS THE PURPOSE OF THE PRO-LIFE MOVEMENT TO RESTORE FULL LEGAL PROTECTION TO ALL CUSTOMERS HUMAN BEINGS, FROM FERTILIZATION TO NATURAL DEATH, USING PEACEFUL AND PRAYERFUL MEANS IN THE PURSUIT OF THAT GOAL.

In furtherance of this purpose, we call on:

You used our pictures for your poster advertisement

Ahmes the Scribe, Pythagoras, Claudius Ptolemy, Aryabhata the elder, Mohammed ibn Musa al-Khowarizmi, Leonardo Fibonacci, Johann Muller alias Regiomonianus, Francois Vi`ete
Francois Viete, Abraham De Moivre, Maria Agnesi, John Wallis, Isaac Barrow, Jules Antoine Lissajous, Edmund Yehezkel Landau, Jean Baptiste Joseph Fourier, Fourier,
Laplace,
Hilbert,
Leonhard Euler,
Taylor
Newton,
Leibniz,
Daniel Bernoulli,
D'Alembert
Lagrange.
Donner wetter! Carl Friedrich Gauss
Jacobi, Oliver Heaviside, Paul Dirac,
Maijer
Lagrange, Poisson,

Theorem 258:

$$\sin^2 x + \cos^2 x = 1.$$

Proof:

$$1 = \cos 0 = \cos(x - x) = \cos x \cos(-x) - \sin x \sin(-x)$$
$$= \cos^2 x + \sin^2 x.$$

Edmund Landau, *Foundations of Analysis*

```
For the proof, we'll use the Pythagorean Identity,
  sin^2x + cos^2x = 1
```

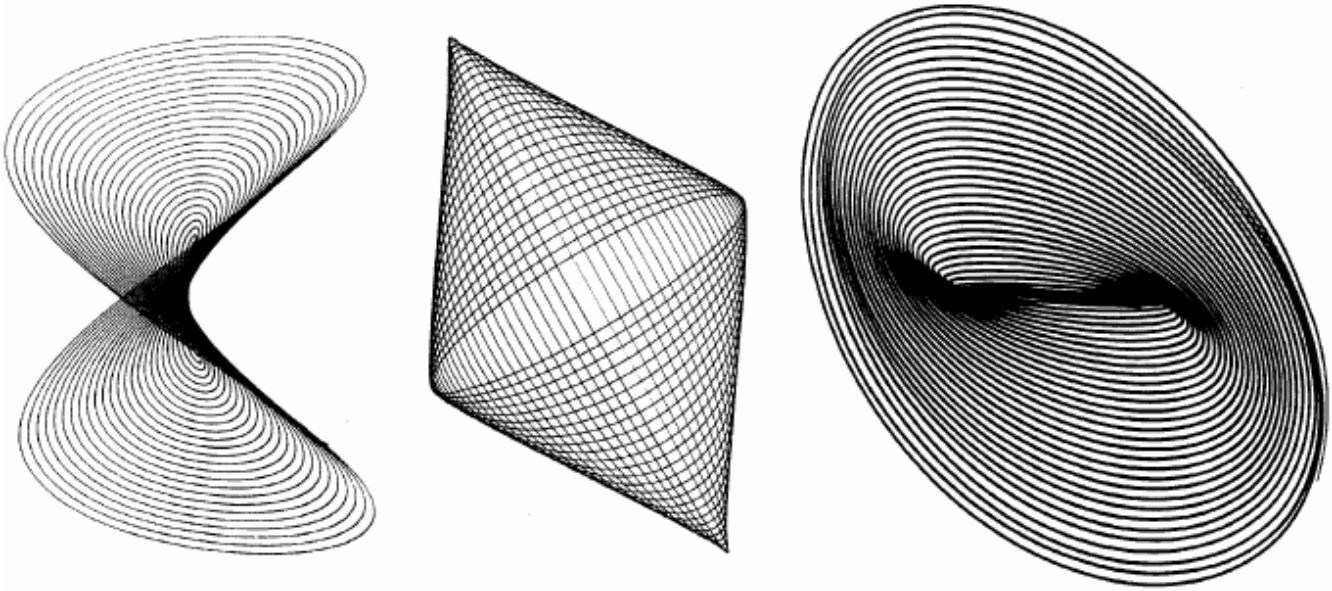


FIG. 74. Harmonograms.

Eli Maor, Trigonometric Delights, © 1998, by Princeton University Press

The friction which results from ignorance can be reduced only by the spread of knowledge. No effort could be better spent.

Nikola Tesla

http://algo.inria.fr/club_maple/mailing_list/msg00559.html

5*2**32

- **To**: **Eric Busvelle <busvelle@u-bourgogne.fr>**
- **Subject**: **5*2**32**
- **From**: **Bruno Salvy <Bruno.Salvy@inria.fr>**
- Date: Fri, 9 Mar 2001 14:42:24 +0100 (MET)
- Cc: "club-maple@inria.fr" <club-maple@inria.fr>
- Content-Transfer-Encoding: 7bit
- Content-Type: multipart/mixed; boundary="s7eHZpGg6l"
- In-Reply-To: <3AA88B11.57D95920@u-bourgogne.fr>
- References: <3AA88B11.57D95920@u-bourgogne.fr>
- Resent-Date: Fri, 9 Mar 2001 14:42:43 +0100
- Resent-From: club-maple@inria.fr
- Resent-Message-ID: <"VABSUry9Wf3.0.xw2.9tDgw"@blagny>
- Resent-Sender: club-maple-request@inria.fr

```
Voici en attachement la reponse officielle de WMI sur ce bug
grave. (Telle que postee dans MUG il y a un mois). Comme cette liste
est en francais, je traduis les points principaux :
```

```
. Il s'agit d'un bug du parser (c'est-a-dire de la partie du logiciel
qui convertit les entrees en des structures de donnees internes);
. ce probleme concerne les entiers dont les dix premieres chiffres
sont (+/-)2147483648 ou (+/-)2147483649 sur des machines 32 bits, et
(+/-)9223372036854775808 ou (+/-)9223372036854775809 sur des machines
64 bits;
. le probleme ne se presente que lorsque ces entiers apparaissent
explicitement dans une entree (clavier ou fichier);
. cette erreur a ete introduite en Maple6 lors de l'ajout d'un nouveau
type d'entiers (les entiers machines) dans le but d'ameliorer
l'efficacite generale du systeme.
```

Example of a good, trustable response to the customers in case of a problem

```
From: Eithne Murray <emurray@maplesoft.com>
Sender: owner-maple-list@daisy.uwaterloo.ca
To: "'maple-list@daisy.uwaterloo.ca'" <maple-list@daisy.uwaterloo.ca>
Subject: [MUG] integer parsing bug
Date: Fri, 9 Feb 2001 09:14:51 -0500

>> From: Eithne Murray <emurray@maplesoft.com>

I would like to take this opportunity to address the concerns raised about the
integer parsing bug. I am including more details from our developers on exactly
when this bug does and does not occur, and why. This way, each user may judge
for himself whether or not this issue will affect his work.   A workaround is
provided so that the problem situation can be avoided entirely.

Because of the exact nature of this bug, the number of users who will run into
this problem is very small. However, we still recognize that it is a serious
problem that must be corrected.  As Sultan Saini stated in a previous posting,
this problem has already been corrected in our development version. We are
currently determining the best method for getting this correction to our users.

When the Bug Occurs

This bug occurs when Maple is parsing integers whose first 10 digits are either
(+/-)2147483648 or (+/-)2147483649 (on 32-bit machines) or when the first 19
digits are either (+/-)9223372036854775808 or (+/-)9223372036854775809 (on
64-bit machines).  Only integers with those exact prefixes are affected.

> 2147483648;

> -2147483648;

> 21474836480;

> 21474836498;


It will occur when the number is explicitly typed into the session, cut and
paste into the session, or read in from a file.

When the Bug Does Not Occur

This problem is caused by a bug in the parser. It will not occur when the number
is generated as a result of a calculation.

> 2147483647 + 1;
                                                      2147483648
> % + 1000000000;
                                                      3147483648
```

```
It does not occur in any types of numbers other than integers.
> 2147483648.0;

It does not occur for any integers other than those starting with the two
10-digit prefixes above.

Workaround

Since calculated results are not affected, this problem can be avoided by
replacing any number starting with one of the two 10-digit problem strings by an
equivalent expression that does not use the prefix.  For example, if your
worksheet contains the input line
> f(21474836489);
replace it with
> f(214748364 * 10^2 + 89);

What Caused the Bug

When Maple reads an integer inputted by a user it reads one digit at a time,
building up the result.  For small integers this scan can be done using the
standard hardware `long' format. For large integers Maple's internal INTPOS or
INTNEG data structure must be used.  Both scans start by using the hardware
format and switch to Maple's format only when needed.  The bug was in the check
for when to switch scan models.  It was checking if the current integer * 10
would still fit in a long and then proceeding to continue with a hardware scan
if so.  It should have been checking if the current integer * 10 + next digit
would fit. Thus integers of the form 2^(WORDSIZE-1)... and 2^(WORDSIZE-1)+1...
written out explicitly were subject to error.

This bug was introduced in Maple 6 due to a significant change in the way Maple
stores small vs. large integers.  Unfortunately, despite thousands of regression
tests and millions of lines of library code this bug was not noticed before
shipping the product.

Please be assured that we are taking this issue seriously, and we will inform
you once decisions regarding the availability of the correction are made.

Sincerely,

Eithne Murray
Product Manager
Waterloo Maple Inc.
```

As I have said before, mat lab has figured out how to make their labels work correctly under linux, unix, mac, ...; so, it is possible.

They were warned, they did it anyway, and it broke their own code. The word "comeuppance" springs to mind.

comeuppance разг. возмездие; заслуженное наказание

he got his comeuppance — он получил по заслугам

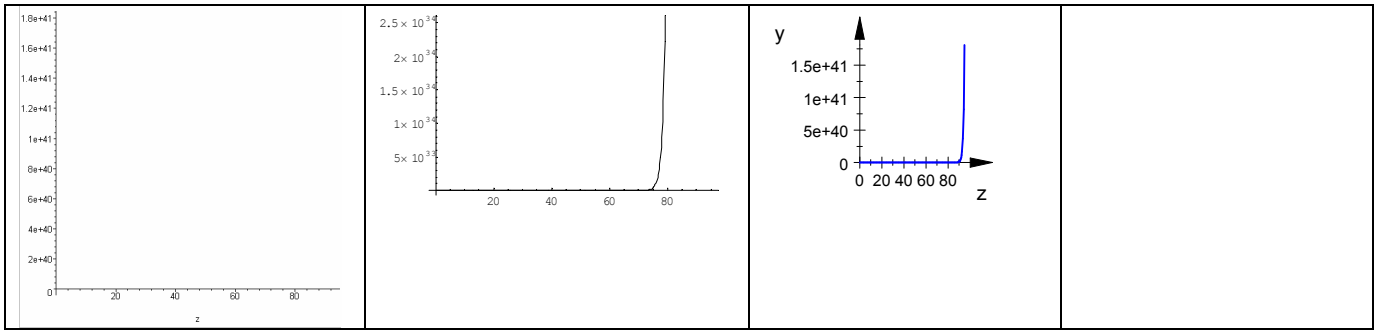
I note here that we are buying Mathematica to do a job, not to be told that it is X11's fault or Mac's ps/pdf implementation fault. All that may in fact be true; however, if Mathematica doesn't work properly then it is broken and there is a bug. The sort of comments I have heard are really irritating, and I wish the developers would just accept the responsibility for a bad choice on

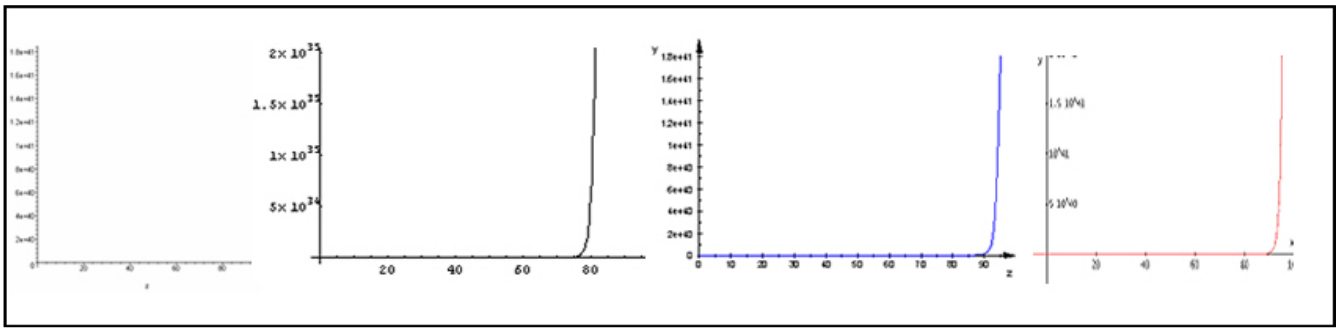
their part, and then fix it.

Numerical Computation
Symbolic Computation
Language and Core System
Data Handling and Visualization
Database Access
GUI Tools
Web Services

Maple 9.5.1 >
```
limit(g(z), z= 0);
limit(z*g(z), z= 0);
limit(g(z)/f(z), z= 0);
limit(z*g(z)/f(z), z= 0);

g(0)
0
g(0)/f(0)
0
```





Customer-FocusedOriented / Customer-Based Approach To Quality

Customer-Focused, Customed-Tuned Approach To Quality

Имя ОС Microsoft Windows XP Professional
Версия 5.1.2600 Сборка 2600

Модель KT400-8235
Тип Компьютер на базе X86
Процессор x86 Family 6 Model 6 Stepping 2 AuthenticAMD ~1400 МГц
Версия BIOS Phoenix Technologies, LTD 6.00 PG, 10.02.2003
Полный объем физической памяти 1 280,00 МБ

……

DOES NOT WORK in CLASSIC WORKSHEETS

?updates,Maple9_5,gui

By default, worksheets open in the enhanced Standard Worksheet interface.

-> Standard Worksheet interface only

Command Completion
Confirmation Dialogs
Elision - Numerics & Lists
Highlighting Text
Hyperlink to a Math Dictionary Definition or a Maplet Application
Interrupting the Current Operation
Opening a Mathematica Notebook Using the File Menu
Options Dialog
Palettes
Animation controls
Automatic Highlighting in 2-D Plots
Displaying Coordinates of 2-D Plots
Scale and Pan 2-D and 3-D Plots and Animations
RTF Copy - Copying Large Selections
Superscript and Subscript Character Styles
Tools Menu

……

Sushi and Engineering, Or, Triumph and Tragedy of Ad Hoc Approach

……

Failing to deliver an environment of quality, Maplesoft's customers have gotten in a sad plight. Can this be fixed?

http://www.maplesoft.com/pressroom/releases/2003/maple9j.shtml

Maplesoft is a world leader in mathematical and analytical software. ?

http://www.maplesoft.com/products/maple/explore.shtml

Maple 9 is the premium software system for any activity that involves mathematics. ?

http://www.maplesoft.com/corporate/

Maplesoft, a division of Waterloo Maple Inc., is a leading producer of advanced software for mathematics. ?

http://www.maplesoft.com/support/

Maplesoft is committed to providing the highest level of support for the products it sells. ?

Motivation

In 1989, there were dozens of thousands Maple users. In 2004, according to Maplesoft data

http://www.maplesoft.com/pressroom/releases/2004/2004-11-02.shtml

'Over 5 million users benefit from advanced Maple technology.'

Thus, for the last 20 years, the number of Maple users has grown dramatically.

One could expect that Maple's quality would grow over these 20 years, too.

However, reading the users's comments on Maple quality, placed in public domain, for example, Maple User Group now defunct, comp.soft-sys.math.maple, sci.math.symbolic etc, leaves a lasting impression that there is a big problem with Maple quality, and it arose not yesterday.

As for now, it seems that praiseful words on Maple an be found on Maplesoft's site only which affront the ear. Even more, over 2 last years, when no Maplesoft official commentes the sad events and proposed a prospect. The absolute silence of Maplesoft part reminds much the following

http://www.consciouschoice.com/environs/riskybusiness1401.html

I cannot imagine any condition which would cause a ship to founder.... Modern shipbuilding has gone beyond that

-- Edward J. Smith, captain of the Titanic.

A year before the nuclear meltdown at Chernobyl, a Soviet deputy minister of the power industry announced that Soviet engineers were confident that you'd have to wait 100,000 years before the Chernobyl reactor had a serious accident.

Shortly before the explosion of the Challenger space shuttle, Bryan O'Connor, nasa's Washington-based director of the shuttle program, recalls that he "asked someone what the probability risk assessment was for the loss of a shuttle. I was told it was one in ten thousand."

The problem with all 3 cases is that no ststematic research has been produced in each above-quoted case, and it was the absence of stability investigation that made the corresponding disasters especially sinistrous, both from personal and economic viewpoint .

Surprisingly, searching over the Internet shows that up to now no systematic research upon evolution of Maple quality has been produced. This resulted in emergence of Maple-related mythology based much on emotions, not facts.

Yet

The significance of this research is twofold: on one hand, it enables users to consult mathematics software directly in their mother tongue. On the other hand, it can be of great help to students learning to use the software, who will be able to consult it or command it in English and see the formalized query popping up on the screen as a result. While mathematical software is usually not too di_cult to learn, some of its command syntax and user interface can be discouraging to new-comers. Maple [2], for instance, is particularly wellsuited to aid university freshmen learn calculus through verifying calculations and plotting complicated graphs. However, understanding calculus concepts while learning to use computer program/mathematics software, and picking up Maple syntax, all at once, can be overwhelming for them. What better way of learning a new syntax than through picking its commands up one by one in your own mother tongue?

We motivate the need for more standard while natural ways of accessing the growing number of internet applications of mathematics software. We then identify a subset of natural language appropriate for this task, and describe an e_cient logic programming transformation from this subset of language into the desired commands. We use substructural logic for dealing with di_erent kinds of mathematical anaphora.We exemplify our ideas in the context of Maple, an advanced mathematics software for symbolic computing.

BOOKMARKS

The stuff you are reading, relates to the final version of this Review like Michelangelo's study do to the David.

Thus, if you look for an impressive document, please stop reading, and wait for the final version of the Review to be released in about 10 months.

Microsoft Internet Explorer

Bandwidth Theft Alert!

This site is illegally stealing bandwidth
from our site, WWW.MICHELANGELO.COM.

We will now load the content page
from our server so you may view it.

Thanks for your patience!

OK

http://www.artprints-on-demand.co.uk/noframes/michelangelo/paul.htm

Michelangelo - Conversion of St Paul

Study of a Standing Male Figure
http://www.allposters.com/IMAGES/HAD/2211.jpg

Another Maplesoft's claim: http://www.maplesoft.com/products/maple/explore.shtml

Maple 9 is the premium software system for any activity that involves mathematics.

Reality? Here you are: `Over 22 years of Maple development, this fresh-level example has been never resolved.`

Maple 9.5.1 > **`limit(sin(z)^2+cos(z)^2, z=infinity);`**

```
            0 .. 2    #  A TERRIBLE bug.  He-he, both the top officers and the
                      #  developers should be lynched on the spot. Over 22 years
                      #  of Maple development, this fresh-level example has been
                      #  never resolved.
```

COMMENT: Derive 6.1, Mathematica 5.0.1 and MuPAD 3.0 calculate this limit correctly.

CALCULATE ME: LIM(SIN(z)^2+COS(z)^2, z, inf)
Limit[Sin[z]^2 + Cos[z]^2, z -> Infinity]
limit(sin(z)^2+cos(z)^2, z= infinity);

1
1
1

COMMENT: Befehle ich jedem fünfzig auf den Blanken.
Die gehören doch an die Front!

Obergruppen-führer W.O. ;-)l

……

http://www.maplesoft.com/pressroom/releases/2003/maple9j.shtml

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http://www.maplesoft.com/products/maple/explore.shtml

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http://www.maplesoft.com/corporate/

Maplesoft, a division of Waterloo Maple Inc., is a leading producer of advanced software for mathematics.

http://www.maplesoft.com/support/

Maplesoft is committed to providing the highest level of support for the products it sells.

Do you realize that your life is in under an imminent danger?

The dark side of Complexity is attacking you, the author, the mankind.

1 994 752 cwmaple9.5.exe

40 960 maplew9.5.exe

D:\Program Files\Maple 9.5\bin.win

10.08.2004 03:17 77 824 cmaple9.5.exe
19.09.2004 06:22 1 994 752 cwmaple9.5.exe
19.09.2004 06:22 40 960 maplew9.5.exe

C:\Program Files\Maple 9.5\bin.win

19.05.2004 11:04 77 824 cmaple9.5.exe
19.05.2004 11:04 1 994 752 cwmaple9.5.exe

19.05.2004 11:04 40 960 maplew9.5.exe

Installation: Successful.

45 SUCCESSES
0 WARNINGS
0 NONFATAL ERRORS
0 FATAL ERRORS

Some information is missing or incorrect.

PERFORMANCE
Many experienced users consider performance the most important aspect of usability: with a fast program, they feel more able to concentrate and more in control. Errors are less important because they can be dealt with quickly. With few exceptions, reviewed by Schneiderman (1987), the faster the better.

Performance has different definitions, such as:

- Program Speed: how quickly the program does standard tasks. For example, how quickly does a word processor move to the end of the file?
- User Throughput: how quickly you can do standard tasks with the program. These are larger scale tasks. For example, how long does it take to enter and print a letter?
- Perceived Performance: How quick does the program seem to you?

Whatever the reason for the program being slow, if it is, it's a problem. Delays as short as a quarter of a second can break your concentration, and substantially increase your time to finish a task.

http://www.mcs.sdsmt.edu/tkowalsk/mathhumor/harmony/FailingMyCalculus.html

Failing my calculus

[This was written by Kenny Felder, a student at North Carolina State University.]

(To the tune of "Closer to Fine" by the Indigo Girls.)

I'm trying to get through this alive,
Maybe figure out these tangents and cosines,
And the best thing you've ever done for me
Is to help me take this course less seriously,
It's only math, after all
yeah

Well, I kind of understood my high school algebra,
And in trig at least I pulled a solid "B",
But Calculus -- I don't know why I'm in it,

Excuse me, but I think I've reached my limit,
As I approach despair.

Chorus:

These *d*'s and these *x*'s, they make me so nervous,
Who cares what the area under a curve is?
I don't know the answer to these questions, slopes and curves and tangent lines,
And the less I see the point of the derivative,
I'm failing my Calculus.
I'm failing my Calculus.

Well, I went to see the teacher, with a sheepish grin,
And he looked at me like I was just a wart upon his chin,
I've tried so hard, but I can't understand it,
I'm so right brained that I can write left handed,
I spent four hours prostrate, staring at the wall,
And I still don't understand *e*.

(Chorus)

I stopped by the Web at three a.m.
To seek help from `alt.algebra`, and possibly from Ken,
But this is just a way that my brain won't work,
So listen, if you'll only do my homework,
I'll help your favorite charity.

(Chorus)

stefanw@math.uni-paderborn.de

Return-Path: <stefanw@math.uni-paderborn.de>
Received: from math.uni-paderborn.de (math.uni-paderborn.de [131.234.100.10])
by strace.net (8.10.2/8.10.2) with ESMTP id g14GQHN08362
for <vvb@mail.strace.net>; Mon, 4 Feb 2002 18:26:18 +0200
Received: from math.uni-paderborn.de (IDENT:stefanw@brutha.uni-paderborn.de [131.234.107.124])
by math.uni-paderborn.de (8.10.1/8.10.1) with ESMTP id g14GQAU11033;
Mon, 4 Feb 2002 17:26:10 +0100 (MET)
Sender: stefanw@math.uni-paderborn.de
Message-ID: <3C5EB622.84148C10@math.uni-paderborn.de>
Date: Mon, 04 Feb 2002 17:26:10 +0100
From: Stefan Wehmeier <stefanw@math.uni-paderborn.de>
Organization: Universitaet Paderborn
X-Mailer: Mozilla 4.79 [en] (X11; U; Linux 2.4.14-SGI_XFS_1.0.2smp i686)
X-Accept-Language: de, en
MIME-Version: 1.0
To: Vladimir Bondarenko <vvb@mail.strace.net>
CC: Christopher Creutzig <ccr@math.uni-paderborn.de>
Subject: Re: Bug#: 566 ...The result of Maple 7 is much more complicated
References: <1434117049.20020202025953@mail.strace.net>
Content-Type: text/plain; charset=us-ascii

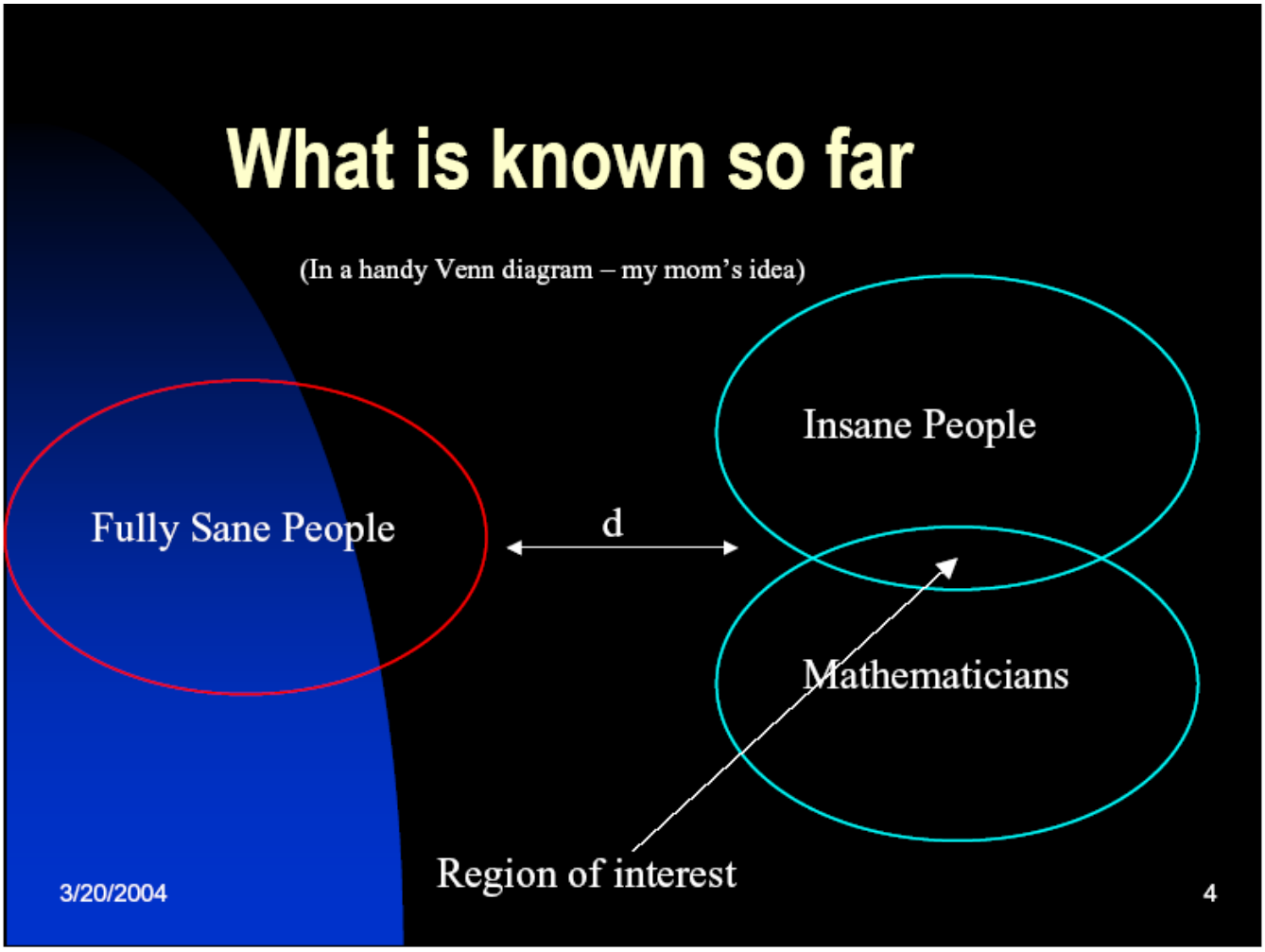
Content-Transfer-Encoding: 7bit
X-UIDL: 9!h!!9]F!!kZ#"!23k"!

Thanks for your excellent testing, sometimes it seems to me you are faster at writing
than I am at reading ....

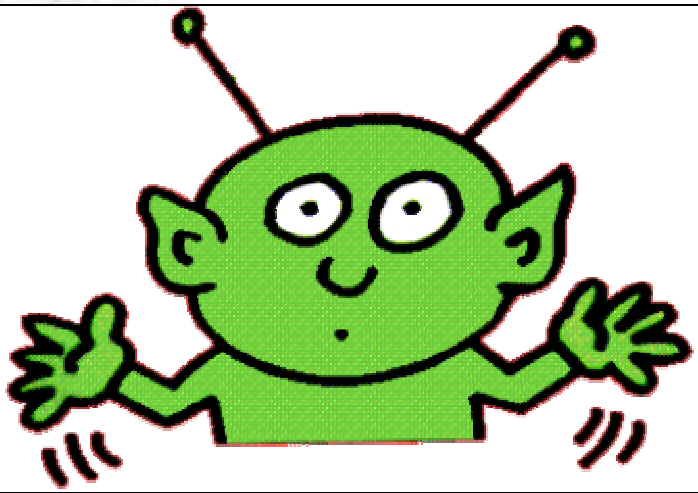
Regards,

Stefan

--
Stefan Wehmeier
stefanw@mupad.de



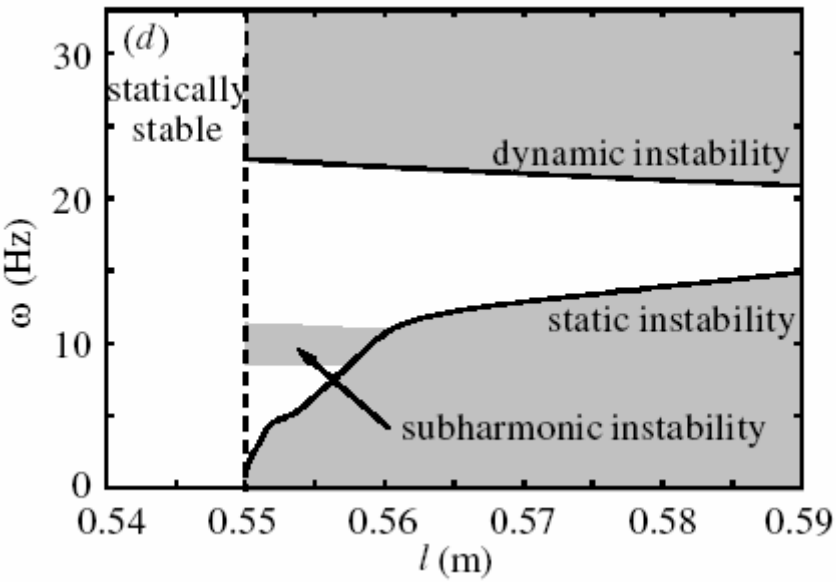
МУНЦ КОСМОС
CAD/CAE/CAM & AEC
ΚΟΣΜΟΣ

	
	
	
Maple user, currently (like a soldier, a miner)	Maple user, after the reform

27

Все прочее — Рейн разливанный: серый поток безбрежного рифмоплетства. Мышление не может быть сплошь поэтическим: иначе оно теряет саму суть: концентрацию смысла. Поэзия важна своими черными дырами, энергетическими сгустками, тромбовидными уплотнениями. Поэты типа Рейна (или Пригова), зарифмовывающие ну все подряд, таким образом размывают границы между поэтическим и не-поэтическим. Количество действительно переходит в качество. Ничтожность повода к тексту оборачивается полной потерей ориентации в пространстве. Поэзия повода как зарифмованная газета, срок жизни которой — день (даже если он длится дольше века). Обреченность на вторичность (в чем обычно обвиняют критику). Поэзия все-таки должна находиться где-то вне времени, немного на иной (см. выше) территории. Все то же самое можно сказать и о самых громких шестидесятниках, Вознесенском-и-Евтушенко, лишивших поэзию поэзии.

28



$v = 2xy + x, \quad f(0) = 0$

Условия Коши - Римана: $\begin{cases} \frac{\partial u}{\partial x} = \frac{\partial v}{\partial y} \\ \frac{\partial u}{\partial y} = -\frac{\partial v}{\partial x} \end{cases}$

$$\frac{\partial v}{\partial y} = 2x = \frac{\partial u}{\partial x} \Rightarrow u(x,y) = \int 2x\,dx = x^2 + \varphi(y)$$

$$\frac{\partial u}{\partial y} = \varphi'(y) = -\frac{\partial v}{\partial x} = -2y - 1$$

$$\varphi'(y) = -2y - 1$$

$$\varphi(y) = -y^2 - y + C$$

$$\Rightarrow u(x,y) = x^2 - y^2 - y + C$$

$$f(z) = u(x,y) + i\,v(x,y) =$$

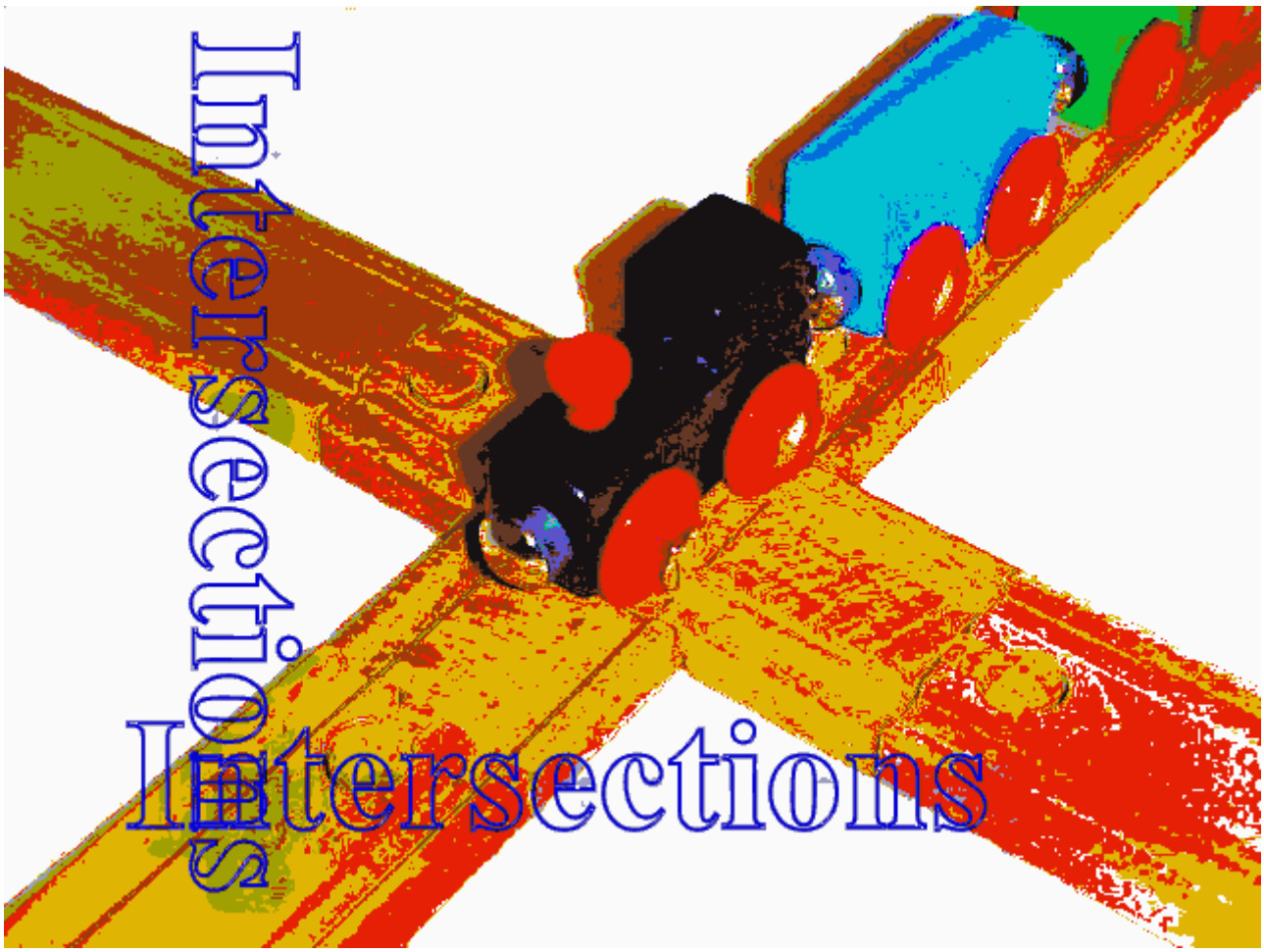
$$= x^2 - y^2 - y + C + i(2xy + x) =$$

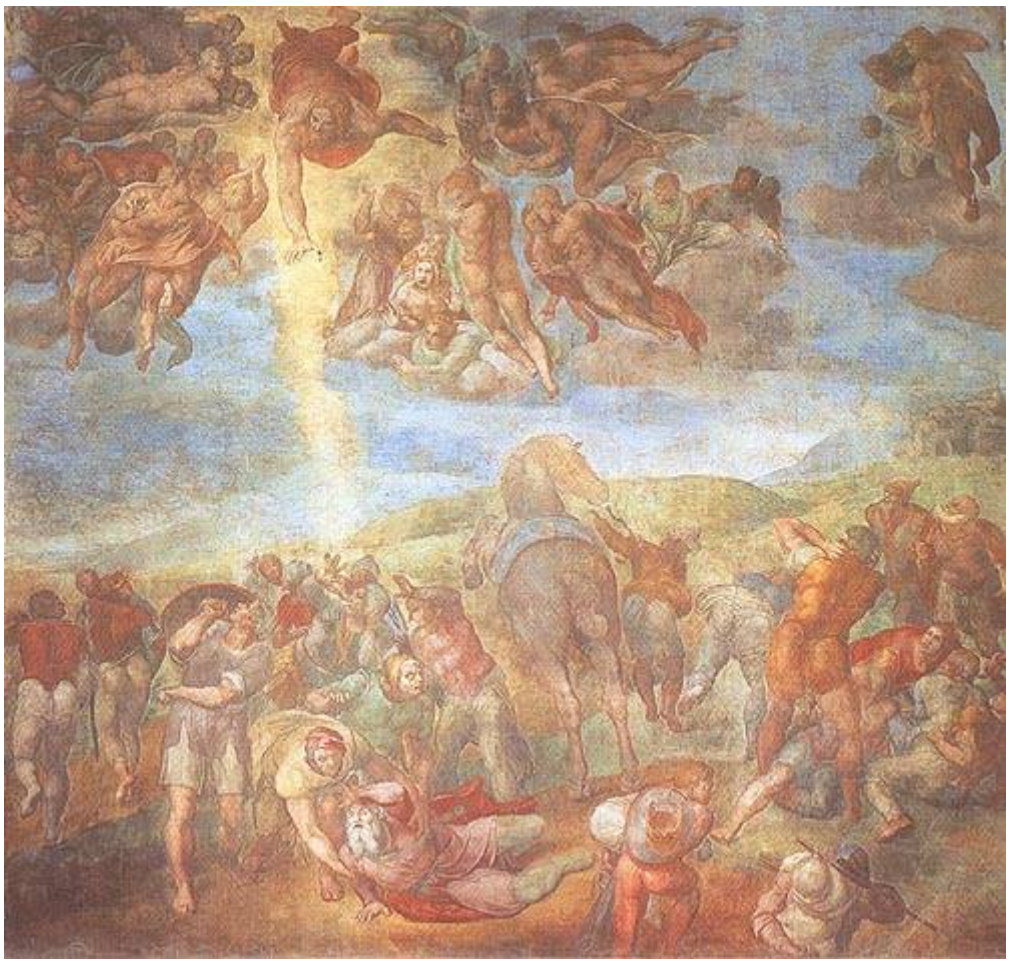
$$= x^2 - y^2 + i2xy + ix - y + C =$$

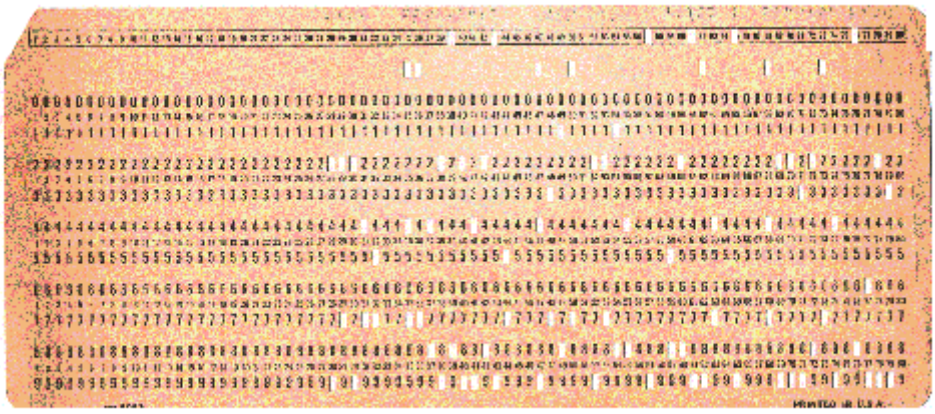
$$= (x + iy)^2 + i(x + iy) + C = z^2 + iz + C$$

$$f(0) = 0 \Rightarrow C = 0$$

$$f(z) = z^2 + iz.$$


Intersections
Intersections

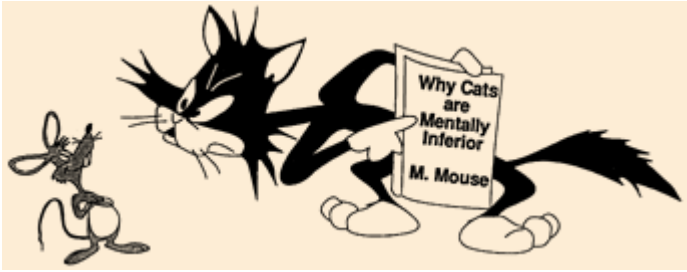




1. $\sin^2(x) + \cos^2(x) = 1$
2. $\sin(2x) = 2\sin(x)\cos(x)$
3. $\cos(2x) = \cos^2(x) - \sin^2(x) = 1 - 2\sin^2(x) = 2\cos^2(x) - 1$
4. $\sin(a + b) = \sin(a)\cos(b) + \sin(b)\cos(a)$
5. $\sin(a - b) = \sin(a)\cos(b) - \sin(b)\cos(a)$
6. $\sin^2(x) = (1 - \cos(2x))/2$
7. $\cos^2(x) = (1 + \cos(2x))/2$
8. $\sin^2 x = 1 - \cos^2 x$
9. $\cos^2 x = 1 - \sin^2 x$
10. $\sec^2 x = 1 + \tan^2 x$
11. $\tan^2 x = \sec^2 x - 1$
12. $\csc^2 x = 1 + \cot^2 x$

$$\int_0^{2\pi} \cos x\, dx = \frac{\sin x}{x}\Big|_0^{2\pi} = \frac{\sin 2\pi}{2\pi} - \frac{\sin 0}{0} = \sin - \sin = 0$$

- The value of the source code availability extends far beyond the simple ability of a particular user to change something the code. Source availability is an additional form of consumer protection.


Why Cats are Mentally Inferior
M. Mouse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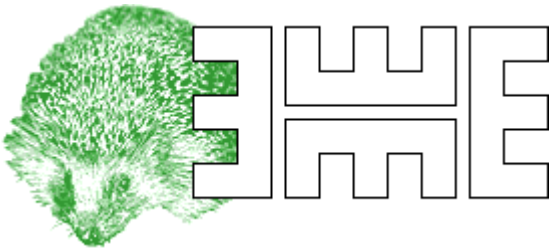
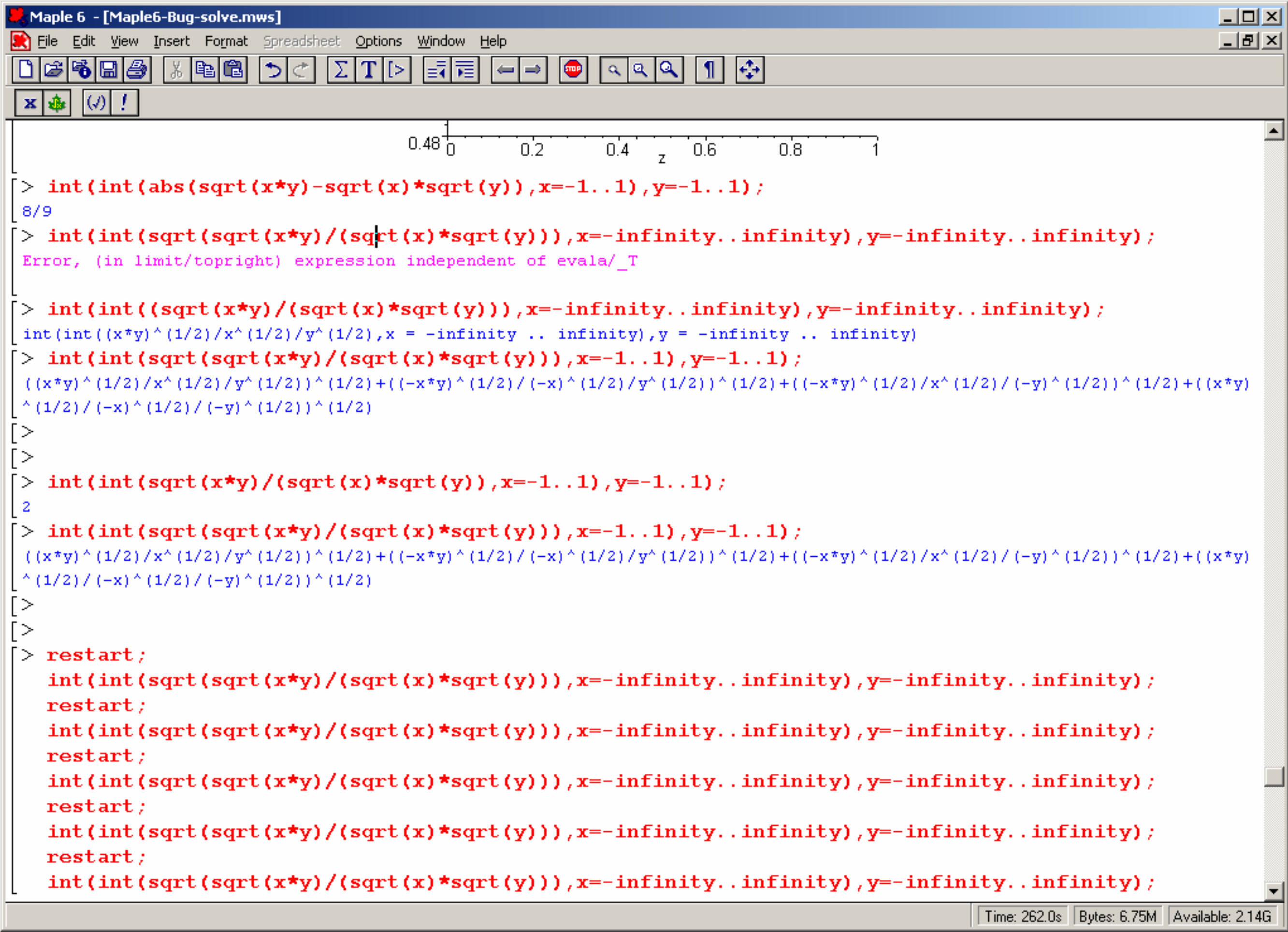
COMPUTER CALCULUS

A DISSERTATION
SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE
AND THE COMMITTEE ON GRADUATE STUDIES
OF STANFORD UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

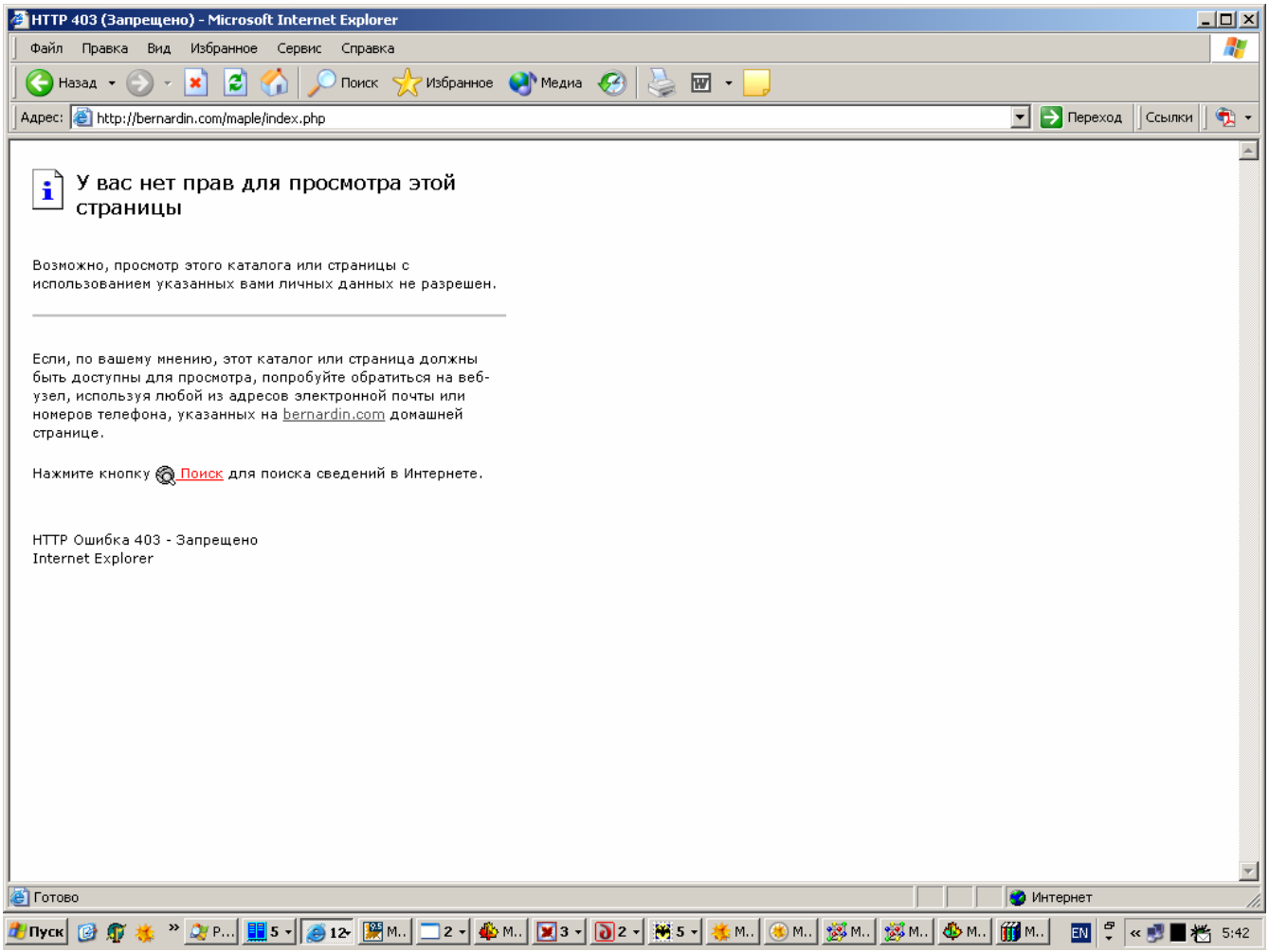
Kelly Brian Roach





You **must** follow these instructions **religiously** if you want the viewer to install properly

In the case of Maxima at least, it always seems that whenever we get ready for a release, we spend lots of time squashing problems that crop up on machines with slightly different configurations (Windows is especially bad - we have had a case or two of the Zombie Bug, where it keeps coming back when we kill it.)



-> The Mathematician's Apprentice

by BY HOLGER PERLT

Maple Users

Target Groups	Per cent
Universities and Colleges	60%
Industry	20%
Research Institutes	10%
Schools	10%

Source: Scientific Computers, Aachen, Germany

Tests and Benchmarks

It is not easy to evaluate the capability of a CA system, and the reviewer's subjective viewpoint is often apparent. But experts from various universities have put some thought into this matter and come up with three major benchmarking areas:

- Solution of algebraic and transcendental equations
- Solution of differential equations
- Calculation of integrals

Nearly every research task will boil down to one of these areas sooner or later. Current versions are occasionally benchmarked along these guidelines and the results are available on the Web. CAS developers do take this seriously. Michael Wester [2], Laurent Bernardin [3], Hans-Gert Graebe [4], and Stefan Steinhaus [5] are probably the most highly regarded benchmarkers.

Without looking at each of the test results individually, one can still say that Maple performs extremely well in all tests. This is true of the major problem areas. Maple users have access to a state-of-the-art tool that will allow them to solve the most complex of problems in a majority of cases.

Kamke's Manual of Ordinary Differential Equations provides an almost classic test suite for ordinary differential equations. It comprises nearly every kind of standard DEQ occurring in applied mathematics. As E. S. Cheb-Terrab [6] reported, Maple 7 was capable of solving 1273 of the 1316 examples – that is, a grand total of 96.7 per cent.

Maple has always played a leading role as regards solutions for standard and partial differential equations and this also applies to algorithms for solving equations.

http://www.cas.mcmaster.ca/sqrl/SQRLNET.html

Software has become a critical technology.

It is essential for telephone networks, aircraft, elevators, medical devices, banking machines, manufacturing, chemical plants, satellites, power plants and many other systems that are important for our health, safety, and well-being. Software is also used in the design of many products that do not contain software. Furthermore, software is also critical for today's business operations. In all of these applications, the quality of the product or service does not depend on the quality of some software.

Unfortunately, even after more than 30 years of research and development, software remains an unmastered technology. In spite of many advances in our theoretical understanding, most software is delivered to customers with serious faults. Modern software has truly impressive capabilities, but it is so badly designed and documented that users find it hard to take advantage of those capabilities. Moreover, users find software to be unreliable and no guarantee is provided; in fact, where most products carry a guarantee, packaged software has a disclaimer.

The time has come to focus on the software quality problem and find ways to make fundamental improvements in our software development processes. It is also time to accept the fact that the problem is not a simple one and cannot be solved by simple "magic bullets" or more enlightened management. Research is required to develop new methods, notations, and tools that work with real software. This research will require close cooperation between researchers with a broad variety of expertise and industry with a broad variety of problems.

Vladimir Bondarenko

Digitally signed by Vladimir Bondarenko
DN: CN = Vladimir Bondarenko, C = UA, O = Cyber Tester, LLC
Reason: I am the author of this document
Date: 2005.06.18 14:18:13 +03'00'