Computer algebra independent integration tests

4-Trig-functions/4.2-Cosine/4.2.9-trig^m-a+b-cos^n+c-cos^-2-n-^p

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July 17, 2021 Compiled on July 17, 2021 at 10:43am

Contents

Chapter 1

Introduction

This report gives the result of running the computer algebra independent integration problems. The listing of the problems are maintained by and can be downloaded from `https://rulebasedintegration.org`

The number of integrals in this report is [20]. This is test number [97].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

1. Mathematica 12.3 (64 bit) on windows 10.
2. Rubi 4.16.1 in Mathematica 12.1 on windows 10.
3. Maple 2021.1 (64 bit) on windows 10.
4. Maxima 5.44 on Linux. (via sagemath 9.3)
5. Fricas 1.3.7 on Linux (via sagemath 9.3)
6. Giac/Xcas 1.7 on Linux. (via sagemath 9.3)
7. Sympy 1.8 under Python 3.8.8 using Anaconda distribution on Ubuntu.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 under windows 10 (64 bit)

Maxima, Fricas and Giac/Xcas were called from inside SageMath. This was done using SageMath integrate command by changing the name of the algorithm to use the different CAS systems.

Sympy was called directly using Python.

1.2 Results

Important note: A number of problems in this test suite have no antiderivative in closed form. This means the antiderivative of these integrals can not be expressed in terms of elementary, special functions or `Hypergeometric2F1` functions. `RootSum` and `RootOf` are not allowed.

If a CAS returns the above integral unevaluated within the time limit, then the result is counted as passed and assigned an A grade.

However, if CAS times out, then it is assigned an F grade even if the integral is not integrable, as this implies CAS could not determine that the integral is not integrable in the time limit.

If a CAS returns an antiderivative to such an integral, it is assigned an A grade automatically and this special result is listed in the introduction section of each individual test report to make it easy to identify as this can be important result to investigate.

The results given in in the table below reflects the above.

System	solved	Failed
Rubi	% 100.00 (20)	% 0.00 (0)
Mathematica	% 100.00 (20)	% 0.00 (0)
Maple	% 100.00 (20)	% 0.00 (0)
Maxima	% 20.00 (4)	% 80.00 (16)
Fricas	% 80.00 (16)	% 20.00 (4)
Sympy	% 25.00 (5)	% 75.00 (15)
Giac	% 60.00 (12)	% 40.00 (8)
Mupad	% 100.00 (20)	% 0.00 (0)

Table 1.1: Percentage solved for each CAS

The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives included in the test suite. The following table describes the meaning of these grades.

grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality. This can be due to one or more of the following reasons 1. antiderivative contains a hypergeometric function and the optimal antiderivative does not. 2. antiderivative contains a special function and the optimal antiderivative does not. 3. antiderivative contains the imaginary unit and the optimal antiderivative does not.
F	Integral was not solved. Either the integral was returned unevaluated within the time limit, or it timed out, or CAS hanged or crashed or an exception was raised.

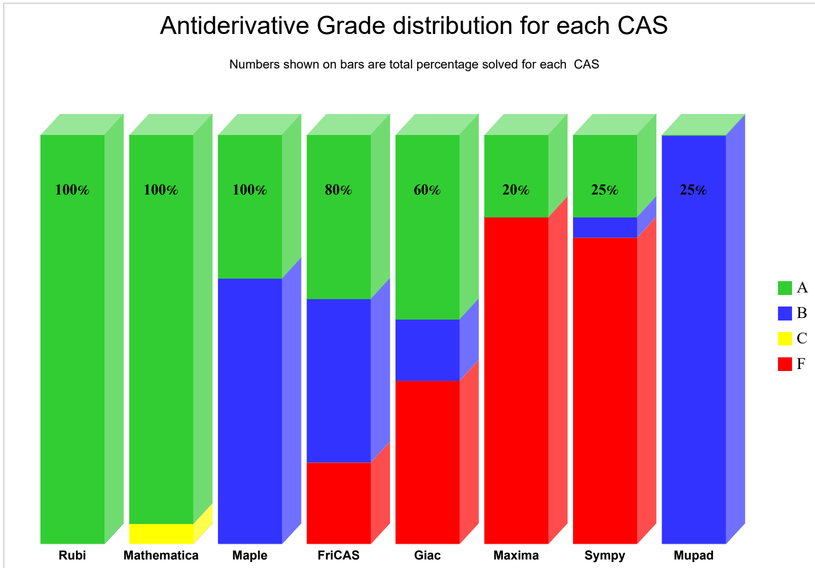
Table 1.2: Description of grading applied to integration result

Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

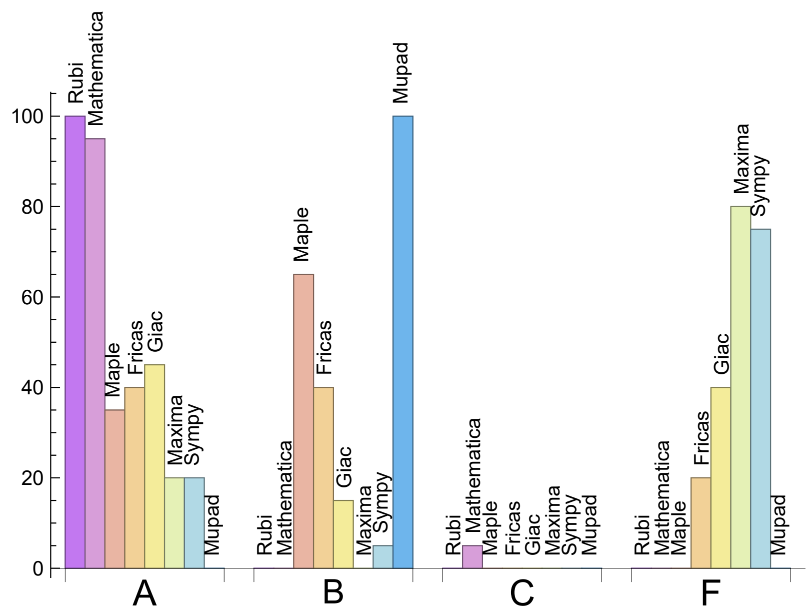
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	95.00	0.00	5.00	0.00
Maple	35.00	65.00	0.00	0.00
Maxima	20.00	0.00	0.00	80.00
Fricas	40.00	40.00	0.00	20.00
Sympy	20.00	5.00	0.00	75.00
Giac	45.00	15.00	0.00	40.00
Mupad	0.00	100.00	0.00	0.00

Table 1.3: Antiderivative Grade distribution of each CAS

The following is a Bar chart illustration of the data in the above table.



The figure below compares the CAS systems for each grade level.



The following table shows the distribution of the different types of failure for each CAS. There are 3 types of reasons why it can fail. The first is when CAS returns back the input within the time limit, which means it could not solve it. This the typical normal failure **F** .

The second is due to time out. CAS could not solve the integral within the 3 minutes time limit which is assigned **F(-1)**.

The third is due to an exception generated. Assigned **F(-2)**. This most likely indicates an interface problem between sagemath and the CAS (applicable only to FriCAS, Maxima and Giac) or it could be an indication of an internal error in CAS. This type of error requires more investigations to determine the cause.

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	0	0.00 %	0.00 %	0.00 %
Mathematica	0	0.00 %	0.00 %	0.00 %
Maple	0	0.00 %	0.00 %	0.00 %
Maxima	16	68.75 %	0.00 %	31.25 %
Fricas	4	0.00 %	100.00 %	0.00 %
Sympy	15	40.00 %	60.00 %	0.00 %
Giac	8	0.00 %	100.00 %	0.00 %
Mupad	0	0.00 %	0.00 %	0.00 %

Table 1.4: Time and leaf size performance for each CAS

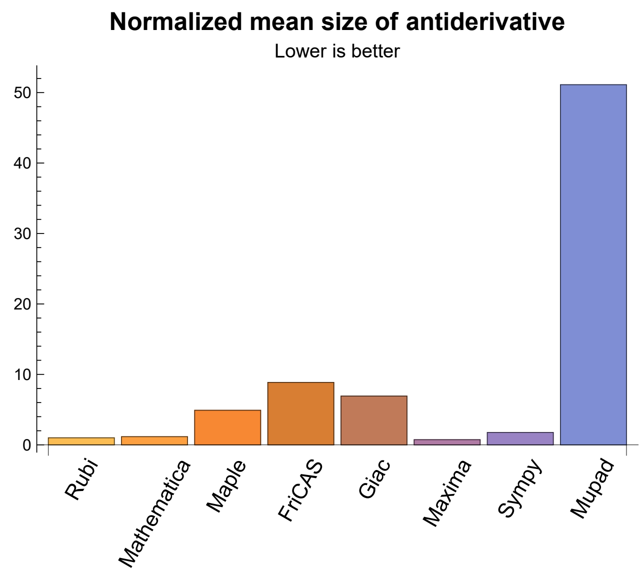
1.3 Performance

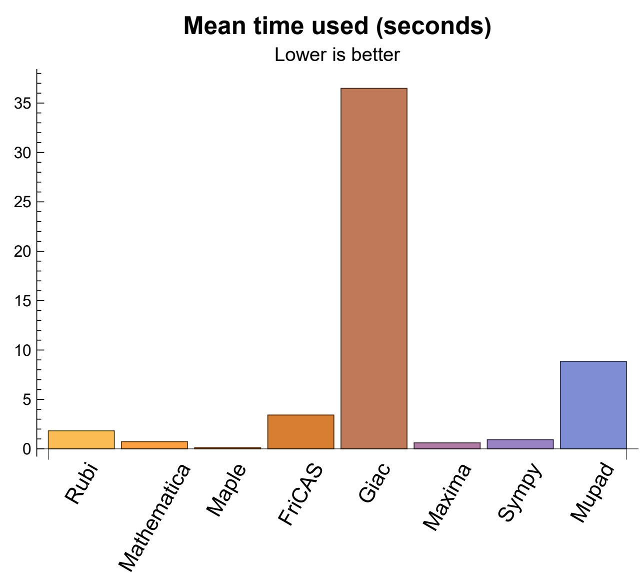
The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	1.82	191.95	1.00	226.50	1.00
Mathematica	0.73	220.15	1.16	238.50	1.03
Maple	0.11	1315.95	4.91	1209.50	4.97
Maxima	0.60	18.25	0.73	15.00	0.75
Fricas	3.42	2258.13	8.86	731.00	3.69
Sympy	0.93	54.20	1.76	26.00	1.37
Giac	36.48	1616.42	6.92	103.00	1.00
Mupad	8.84	15358.45	51.12	5501.00	24.29

Table 1.5: Time and leaf size performance for each CAS

The following are bar charts for the normalized leafsize and time used columns from the above table.





1.4 list of integrals that has no closed form antiderivative

{}

1.5 list of integrals solved by CAS but has no known antiderivative

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

The following are integrals solved by CAS but the verification phase failed to verify the anti-derivative produced is correct. This does not mean necessarily that the anti-derivative is wrong, as additional methods of verification might be needed, or more time is needed (3 minutes time limit was used). These integrals are listed here to make it easier to do further investigation to determine why it was not possible to verify the result produced.

Rubi {}

Mathematica {}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

The command `AboluteTiming[]` was used in Mathematica to obtain the elapsed time for each integrate call. In Maple, the command `Usage` was used as in the following example

```
cpu_time := Usage(assign ('result_of _int',int(expr,x)),output='realtime'
```

For all other CAS systems, the elapsed time to complete each integral was found by taking the difference between the time after the call has completed from the time before the call was made. This was done using Python's `time.time()` call.

All elapsed times shown are in seconds. A time limit of 3 minutes was used for each integral. If the integrate command did not complete within this time limit, the integral was aborted and considered to have failed and assigned an F grade. The time used by failed integrals due to time out is not counted in the final statistics.

1.8 Verification

A verification phase was applied on the result of integration for Rubi and Mathematica. Future version of this report will implement verification for the other CAS systems. For the integrals whose result was not run through a verification phase, it is assumed that the antiderivative produced was correct.

Verification phase has 3 minutes time out. An integral whose result was not verified could still be correct. Further investigation is needed on those integrals which failed verifications. Such integrals are marked in the summary table below and also in each integral separate section so they are easy to identify and locate.

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

Since these integrals are run in a batch mode, using an automated script, and by using sagemath (SageMath uses Maxima), then any integral where Maxima needs an interactive response from the user to answer a question during evaluation of the integral in order to complete the integration, will fail and is counted as failed.

The exception raised is `ValueError`. Therefore Maxima result below is lower than what could result if Maxima was run directly and each question Maxima asks was answered correctly.

The percentage of such failures were not counted for each test file, but for an example, for the Timofeev test file, there were about 14 such integrals out of total 705, or about 2 percent. This pecrentage can be higher or lower depending on the specific input test file.

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. The exception message will indicate of the error is due to the interactive question being asked or not.

Maxima integrate was run using SageMath with the following settings set by default

```
'besselexpand : true'
'display2d : false'
'domain : complex'
'keepfloat : true'
'load(to_poly_solve)'
'load(simplify_sum)'
'load(abs_integrate)' 'load(diag)'
```

SageMath loading of Maxima `abs_integrate` was found to cause some problem. So the following code was added to disable this effect.

```
from sage.interfaces.maxima_lib import maxima_lib
maxima_lib.set('extra_definite_integration_methods', '[]')
maxima_lib.set('extra_integration_methods', '[]')
```

See https://ask.sagemath.org/question/43088/integrate-results-that-are-different-from-using-maxima/ for reference.

1.9.2 Important note about FriCAS and Giac/XCAS results

There are Few integrals which failed due to SageMath not able to translate the result back to SageMath syntax and not because these CAS system were not able to do the integrations.

These will fail With error `Exception raised: NotImplementedError`

The number of such cases seems to be very small. About 1 or 2 percent of all integrals.

Hopefully the next version of SageMath will have complete translation of FriCAS and XCAS syntax and I will re-run all the tests again when this happens.

1.9.3 Important note about finding leaf size of antiderivative

For Mathematica, Rubi and Maple, the buildin system function `LeafSize` is used to find the leaf size of each antiderivative.

The other CAS systems (SageMath and Sympy) do not have special buildin function for this purpose at this time. Therefore the leaf size for Fricas and Sympy and Giac antiderivatives is determined using the following function, thanks to user `slelievre` at https://

ask.sagemath.org/question/57123/could-we-have-a-leaf_count-function-in-base-sagemath/

```
def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)
```

For Sympy, which is called directly from Python, the following code is used to obtain the leafsize of its result

```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
  leafCount = round(1.7*count_ops(anti))

  except Exception as ee:
         leafCount =1
```

1.9.4 Important note about Mupad results

Matlab's symbolic toolbox does not have a leaf count function to measure the size of the antiderivative, Maple was used to determine the leaf size of Mupad output by post processing.

Currently no grading of the antiderivative for Mupad is implemented. If it can integrate the problem, it was assigned a B grade automatically as a placeholder. In the future, when grading function is implemented for Mupad, the tests will be rerun again.

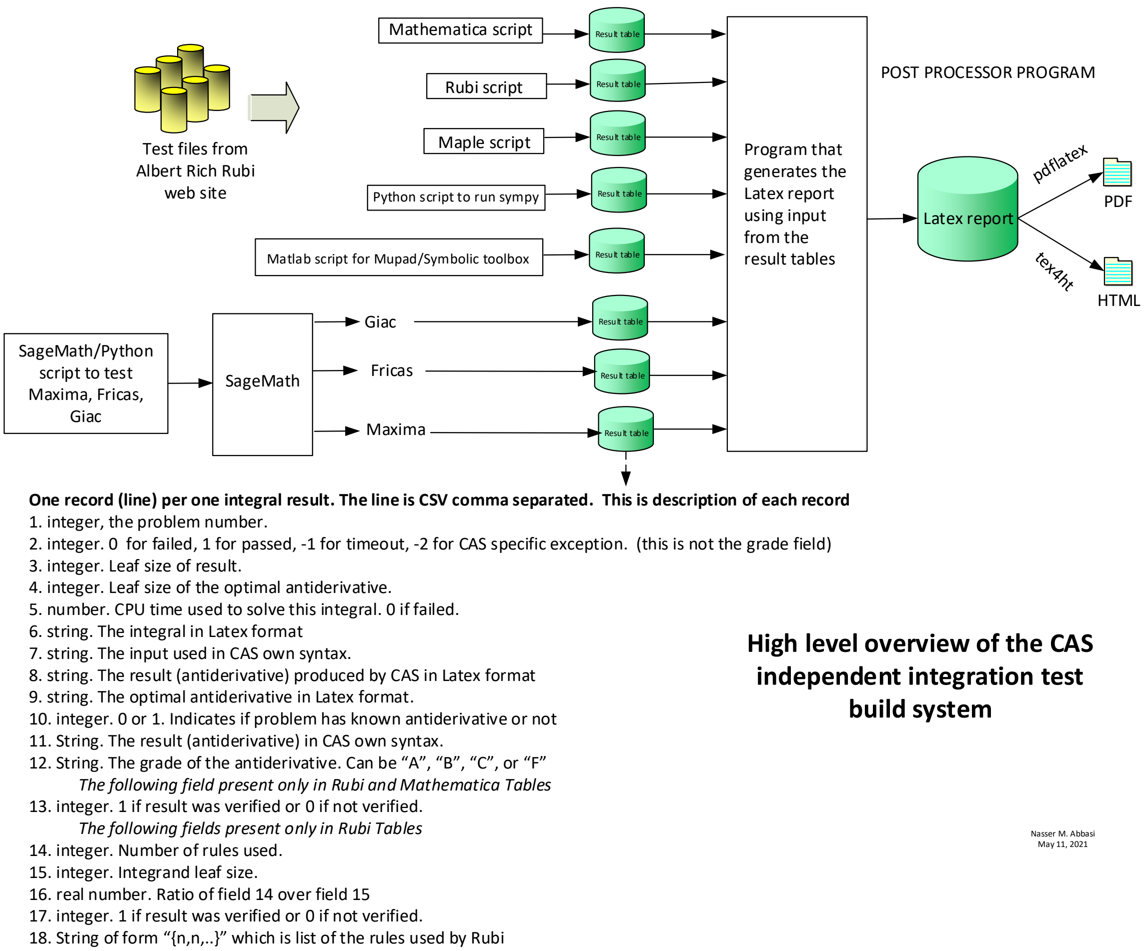
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

```
integrand = evalin(symengine,'cos(x)*sin(x)')
the_variable = evalin(symengine,'x')
anti = int(integrand,the_variable)
```

Which gives `sin(x)^2/2`

1.10 Design of the test system

The following diagram gives a high level view of the current test build system.



Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 }

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 }

B grade: { }

C grade: { 5 }

F grade: { }

2.1.3 Maple

A grade: { 2, 3, 4, 9, 10, 11, 12 }

B grade: { 1, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 20 }

C grade: { }

F grade: { }

2.1.4 Maxima

A grade: { 9, 10, 11, 12 }

B grade: { }

C grade: { }

F grade: { 1, 2, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 20 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 4, 9, 10, 11, 12 }

B grade: { 5, 6, 7, 13, 14, 15, 16, 17 }

C grade: { }

F grade: { 8, 18, 19, 20 }

2.1.6 Sympy

A grade: { 3, 9, 10, 11 }

B grade: { 12 }

C grade: { }

F grade: { 1, 2, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 20 }

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 9, 10, 11, 12 }

B grade: { 7, 15, 17 }

C grade: { }

F grade: { 6, 8, 13, 14, 16, 18, 19, 20 }

2.1.8 Mupad

A grade: { }

B grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 }

C grade: { }

F grade: { }

2.2 Detailed conclusion table per each integral for all CAS systems

Detailed conclusion table per each integral is given by table below. The elapsed time is in seconds. For failed result it is given as F(-1) if the failure was due to timeout. It is given as F(-2) if the failure was due to an exception being raised, which could indicate a bug in the system. If the failure was due to integral not being evaluated within the time limit, then it is given just an F.

In this table,the column **normalized size** is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	239	344	0	491	0	153	197
normalized size	1	1.00	1.76	2.53	0.00	3.61	0.00	1.12	1.45
time (sec)	N/A	0.232	0.568	0.089	0.000	1.420	0.000	0.330	2.406

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	131	141	0	258	0	76	226
normalized size	1	1.00	1.72	1.86	0.00	3.39	0.00	1.00	2.97
time (sec)	N/A	0.130	0.271	0.078	0.000	2.261	0.000	0.377	0.187

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	39	36	0	126	99	35	47
normalized size	1	1.00	1.11	1.03	0.00	3.60	2.83	1.00	1.34
time (sec)	N/A	0.046	0.034	0.063	0.000	1.767	2.954	0.332	2.416

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	126	223	0	470	0	130	1003
normalized size	1	1.00	0.98	1.73	0.00	3.64	0.00	1.01	7.78
time (sec)	N/A	0.172	0.199	0.115	0.000	3.289	0.000	0.275	4.971

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	392	546	0	1991	0	378	2742
normalized size	1	1.00	1.91	2.66	0.00	9.71	0.00	1.84	13.38
time (sec)	N/A	0.465	2.326	0.139	0.000	18.117	0.000	0.345	18.733

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	388	386	374	2608	0	5045	0	0	46613
normalized size	1	0.99	0.96	6.72	0.00	13.00	0.00	0.00	120.14
time (sec)	N/A	11.013	0.892	0.152	0.000	3.579	0.000	0.000	13.770

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	260	260	238	1157	0	971	0	6564	16390
normalized size	1	1.00	0.92	4.45	0.00	3.73	0.00	25.25	63.04
time (sec)	N/A	1.284	0.632	0.108	0.000	1.114	0.000	177.349	13.282

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	326	326	335	2816	0	0	0	0	39229
normalized size	1	1.00	1.03	8.64	0.00	0.00	0.00	0.00	120.33
time (sec)	N/A	3.340	0.973	0.150	0.000	0.000	0.000	0.000	13.532

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	21	21	19	16	15	17	15	17	9
normalized size	1	1.00	0.90	0.76	0.71	0.81	0.71	0.81	0.43
time (sec)	N/A	0.024	0.027	0.082	0.335	0.582	0.202	0.298	0.163

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	29	16	15	19	15	19	9
normalized size	1	1.00	1.26	0.70	0.65	0.83	0.65	0.83	0.39
time (sec)	N/A	0.028	0.014	0.083	0.322	0.485	0.183	0.419	0.105

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	18	18	15	19	26	15	15
normalized size	1	1.00	0.95	0.95	0.79	1.00	1.37	0.79	0.79
time (sec)	N/A	0.036	0.026	0.070	0.854	0.758	0.270	0.599	0.055

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	34	31	28	38	116	28	30
normalized size	1	1.00	0.94	0.86	0.78	1.06	3.22	0.78	0.83
time (sec)	N/A	0.033	0.077	0.078	0.898	1.119	1.020	0.484	0.061

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	326	326	356	3427	0	8167	0	0	45364
normalized size	1	1.00	1.09	10.51	0.00	25.05	0.00	0.00	139.15
time (sec)	N/A	4.062	1.132	0.122	0.000	10.034	0.000	0.000	14.692

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	299	299	309	2503	0	6529	0	0	29362
normalized size	1	1.00	1.03	8.37	0.00	21.84	0.00	0.00	98.20
time (sec)	N/A	6.758	0.890	0.112	0.000	3.216	0.000	0.000	12.680

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	264	1948	0	4983	0	9028	20133
normalized size	1	1.00	1.04	7.64	0.00	19.54	0.00	35.40	78.95
time (sec)	N/A	1.262	0.589	0.105	0.000	2.719	0.000	165.933	14.558

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	227	1264	0	3513	0	0	5488
normalized size	1	1.00	0.99	5.50	0.00	15.27	0.00	0.00	23.86
time (sec)	N/A	0.546	0.570	0.099	0.000	1.961	0.000	0.000	11.720

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	198	1262	0	3493	0	2954	5514
normalized size	1	1.00	0.89	5.66	0.00	15.66	0.00	13.25	24.73
time (sec)	N/A	0.350	0.412	0.096	0.000	2.279	0.000	91.057	11.923

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	245	245	281	1957	0	0	0	0	20126
normalized size	1	1.00	1.15	7.99	0.00	0.00	0.00	0.00	82.15
time (sec)	N/A	0.772	0.666	0.136	0.000	0.000	0.000	0.000	13.548

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	275	275	348	2530	0	0	0	0	29417
normalized size	1	1.00	1.27	9.20	0.00	0.00	0.00	0.00	106.97
time (sec)	N/A	1.189	1.176	0.154	0.000	0.000	0.000	0.000	13.183

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F(-1)	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	334	334	446	3476	0	0	0	0	45255
normalized size	1	1.00	1.34	10.41	0.00	0.00	0.00	0.00	135.49
time (sec)	N/A	4.674	3.074	0.158	0.000	0.000	0.000	0.000	14.815

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [5] had the largest ratio of [.4737]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	7	6	1.00	19	0.316
2	A	7	6	1.00	19	0.316
3	A	3	3	1.00	17	0.176

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
4	A	9	8	1.00	17	0.471
5	A	10	9	1.00	19	0.474
6	A	10	7	0.99	19	0.368
7	A	7	4	1.00	19	0.210
8	A	9	5	1.00	19	0.263
9	A	4	3	1.00	13	0.231
10	A	4	3	1.00	15	0.200
11	A	3	3	1.00	15	0.200
12	A	4	4	1.00	15	0.267
13	A	10	7	1.00	19	0.368
14	A	8	5	1.00	19	0.263
15	A	7	4	1.00	19	0.210
16	A	6	3	1.00	17	0.176
17	A	5	3	1.00	14	0.214
18	A	8	5	1.00	17	0.294
19	A	10	7	1.00	19	0.368
20	A	12	8	1.00	19	0.421

Chapter 3

Listing of integrals

3.1 $\int \frac{\sin^5(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=136

$$\frac{b\left(b^2-2c(a+c)\right)\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2c^4}-\frac{\cos(x)\left(b^2-c(a+2c)\right)}{c^3}+\frac{\left(-2b^2c(2a+c)+2c^2(a+c)^2+b^4\right)\text{ta}}{c^4\sqrt{b^2-4ac}}$$

```
[Out] -(b^2-c*(a+2*c))*cos(x)/c^3+1/2*b*cos(x)^2/c^2-1/3*cos(x)^3/c+1/2*b*(b^2-2*
c*(a+c))*ln(a+b*cos(x)+c*cos(x)^2)/c^4+(b^4+2*c^2*(a+c)^2-2*b^2*c*(2*a+c))*
arctanh((b+2*c*cos(x))/(-4*a*c+b^2)^(1/2))/c^4/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {3259, 1657, 634, 618, 206, 628}

$$-\frac{\cos(x)\left(b^2-c(a+2c)\right)}{c^3}+\frac{b\left(b^2-2c(a+c)\right)\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2c^4}+\frac{\left(-2b^2c(2a+c)+2c^2(a+c)^2+b^4\right)\text{t}}{c^4\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]^5/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] ((b^4 + 2*c^2*(a + c)^2 - 2*b^2*c*(2*a + c))*ArcTanh[(b + 2*c*Cos[x])/Sqrt[
b^2 - 4*a*c]])/(c^4*Sqrt[b^2 - 4*a*c]) - ((b^2 - c*(a + 2*c))*Cos[x])/c^3 +
 (b*Cos[x]^2)/(2*c^2) - Cos[x]^3/(3*c) + (b*(b^2 - 2*c*(a + c))*Log[a + b*C
os[x] + c*Cos[x]^2])/(2*c^4)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 1657

```
Int[(Pq_)*((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[Expand
Integrand[Pq*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c}, x] && PolyQ[Pq
, x] && IGtQ[p, -2]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$\int \frac{\sin^5(x)}{a + b\cos(x) + c\cos^2(x)}\,dx = -\text{Subst}\left(\int \frac{\left(1-x^2\right)^2}{a+bx+cx^2}\,dx, x, \cos(x)\right)$$

$$= -\text{Subst}\left(\int\left(\frac{b^2-c(a+2c)}{c^3} - \frac{bx}{c^2} + \frac{x^2}{c} - \frac{-a^2c-c^3+a\left(b^2-2c^2\right)+b\left(b^2-2c(\right.}{c^3\left(a+bx+cx^2\right)}\right.\right.$$

$$= -\frac{\left(b^2-c(a+2c)\right)\cos(x)}{c^3} + \frac{b\cos^2(x)}{2c^2} - \frac{\cos^3(x)}{3c} + \frac{\text{Subst}\left(\int \frac{-a^2c-c^3+a\left(b^2-2c^2\right)+b\left(\right.}{a+bx+cx^2}\right.}{c^3}$$

$$= -\frac{\left(b^2-c(a+2c)\right)\cos(x)}{c^3} + \frac{b\cos^2(x)}{2c^2} - \frac{\cos^3(x)}{3c} + \frac{\left(b\left(b^2-2c(a+c)\right)\right)\text{Subst}\left(\right.}{2c^4}$$

$$= -\frac{\left(b^2-c(a+2c)\right)\cos(x)}{c^3} + \frac{b\cos^2(x)}{2c^2} - \frac{\cos^3(x)}{3c} + \frac{b\left(b^2-2c(a+c)\right)\log\left(a+b\right.}{2c^4}$$

$$= \frac{\left(b^4+2c^2(a+c)^2-2b^2c(2a+c)\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{c^4\sqrt{b^2-4ac}} - \frac{\left(b^2-c(a+2c)\right)\cos(x)}{c^3}$$

Mathematica [A] time = 0.57, size = 239, normalized size = 1.76

$$\frac{3c\cos(x)\left(c(4a+7c)-4b^2\right) + \frac{6\left(2b^2c(2a+c)-2bc(a+c)\sqrt{b^2-4ac}+b^3\sqrt{b^2-4ac}-2c^2(a+c)^2-b^4\right)\log\left(\sqrt{b^2-4ac}-b-2c\cos(x)\right)}{\sqrt{b^2-4ac}} + \frac{6\left(-2b^2c(2a+\right.}{}}{12c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]^5/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (3*c*(-4*b^2 + c*(4*a + 7*c))*Cos[x] + 3*b*c^2*Cos[2*x] - c^3*Cos[3*x] + (6
*(-b^4 - 2*c^2*(a + c)^2 + 2*b^2*c*(2*a + c) + b^3*Sqrt[b^2 - 4*a*c] - 2*b*
c*(a + c)*Sqrt[b^2 - 4*a*c])*Log[-b + Sqrt[b^2 - 4*a*c] - 2*c*Cos[x]])/Sqrt
[b^2 - 4*a*c] + (6*(b^4 + 2*c^2*(a + c)^2 - 2*b^2*c*(2*a + c) + b^3*Sqrt[b^
2 - 4*a*c] - 2*b*c*(a + c)*Sqrt[b^2 - 4*a*c])*Log[b + Sqrt[b^2 - 4*a*c] + 2
*c*Cos[x]])/Sqrt[b^2 - 4*a*c])/(12*c^4)
```

fricas [A] time = 1.42, size = 491, normalized size = 3.61

$$\left[-\frac{2\left(b^2c^3-4\,ac^4\right)\cos(x)^3 - 3\left(b^3c^2-4\,abc^3\right)\cos(x)^2 - 3\left(b^4-4\,ab^2c+4\,ac^3+2\,c^4+2\left(a^2-b^2\right)c^2\right)\sqrt{b^2-4\,ac}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^5/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] [-1/6*(2*(b^2*c^3 - 4*a*c^4)*cos(x)^3 - 3*(b^3*c^2 - 4*a*b*c^3)*cos(x)^2 -
3*(b^4 - 4*a*b^2*c + 4*a*c^3 + 2*c^4 + 2*(a^2 - b^2)*c^2)*sqrt(b^2 - 4*a*c)
*log(-(2*c^2*cos(x)^2 + 2*b*c*cos(x) + b^2 - 2*a*c + sqrt(b^2 - 4*a*c)*(2*c
*cos(x) + b))/(c*cos(x)^2 + b*cos(x) + a)) + 6*(b^4*c - 5*a*b^2*c^2 + 8*a*c
^4 + 2*(2*a^2 - b^2)*c^3)*cos(x) - 3*(b^5 - 6*a*b^3*c + 8*a*b*c^3 + 2*(4*a^
2*b - b^3)*c^2)*log(c*cos(x)^2 + b*cos(x) + a))/(b^2*c^4 - 4*a*c^5), -1/6*(
2*(b^2*c^3 - 4*a*c^4)*cos(x)^3 - 3*(b^3*c^2 - 4*a*b*c^3)*cos(x)^2 - 6*(b^4
- 4*a*b^2*c + 4*a*c^3 + 2*c^4 + 2*(a^2 - b^2)*c^2)*sqrt(-b^2 + 4*a*c)*arcta
n(-sqrt(-b^2 + 4*a*c)*(2*c*cos(x) + b)/(b^2 - 4*a*c)) + 6*(b^4*c - 5*a*b^2*
c^2 + 8*a*c^4 + 2*(2*a^2 - b^2)*c^3)*cos(x) - 3*(b^5 - 6*a*b^3*c + 8*a*b*c^
3 + 2*(4*a^2*b - b^3)*c^2)*log(c*cos(x)^2 + b*cos(x) + a))/(b^2*c^4 - 4*a*c
^5)]
```

giac [A] time = 0.33, size = 153, normalized size = 1.12

$$-\frac{2\,c^2\cos(x)^3 - 3\,bc\cos(x)^2 + 6\,b^2\cos(x) - 6\,ac\cos(x) - 12\,c^2\cos(x)}{6\,c^3} + \frac{\left(b^3 - 2\,abc - 2\,bc^2\right)\log\left(c\cos(x)^2 + b\cos(\right.}{2\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^5/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] -1/6*(2*c^2*cos(x)^3 - 3*b*c*cos(x)^2 + 6*b^2*cos(x) - 6*a*c*cos(x) - 12*c^
2*cos(x))/c^3 + 1/2*(b^3 - 2*a*b*c - 2*b*c^2)*log(c*cos(x)^2 + b*cos(x) + a
)/c^4 - (b^4 - 4*a*b^2*c + 2*a^2*c^2 - 2*b^2*c^2 + 4*a*c^3 + 2*c^4)*arctan(
(2*c*cos(x) + b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*c^4)
```

maple [B] time = 0.09, size = 344, normalized size = 2.53

$$-\frac{\cos^3(x)}{3c} + \frac{b\left(\cos^2(x)\right)}{2c^2} + \frac{\cos(x)a}{c^2} - \frac{\cos(x)b^2}{c^3} + \frac{2\cos(x)}{c} - \frac{\ln\left(a + b\cos(x) + c\left(\cos^2(x)\right)\right)ab}{c^3} + \frac{\ln\left(a + b\cos(x) + c\left(\mathrm{cc}\right.\right.}{2c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)^5/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] -1/3*cos(x)^3/c+1/2*b*cos(x)^2/c^2+1/c^2*cos(x)*a-1/c^3*cos(x)*b^2+2*cos(x)
/c-1/c^3*ln(a+b*cos(x)+c*cos(x)^2)*a*b+1/2/c^4*ln(a+b*cos(x)+c*cos(x)^2)*b^
3-b*ln(a+b*cos(x)+c*cos(x)^2)/c^2-2/c^2/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos
(x))/(4*a*c-b^2)^(1/2))*a^2+4/c^3/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(
4*a*c-b^2)^(1/2))*b^2*a-4/c/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-
```

```
b^2)^(1/2))*a-2/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))-
1/c^4/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*b^4+2/c^2/
(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*b^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^5/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 2.41, size = 197, normalized size = 1.45

$$\cos(x)\left(\frac{a}{c^2}+\frac{2}{c}-\frac{b^2}{c^3}\right)-\frac{\cos(x)^3}{3\,c}-\frac{\ln\left(c\cos(x)^2+b\,\cos(x)+a\right)\left(8\,a^2\,b\,c^2-6\,a\,b^3\,c+8\,a\,b\,c^3+b^5-2\,b^3\,c^2\right)}{2\left(4\,a\,c^5-b^2\,c^4\right)}+\frac{b\,\mathrm{co}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)^5/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] cos(x)*(a/c^2 + 2/c - b^2/c^3) - cos(x)^3/(3*c) - (log(a + b*cos(x) + c*cos
(x)^2)*(b^5 - 2*b^3*c^2 + 8*a^2*b*c^2 + 8*a*b*c^3 - 6*a*b^3*c))/(2*(4*a*c^5
 - b^2*c^4)) + (b*cos(x)^2)/(2*c^2) - (atan(b/(4*a*c - b^2)^(1/2) + (2*c*co
s(x))/(4*a*c - b^2)^(1/2))*(4*a*c^3 + b^4 + 2*c^4 + 2*a^2*c^2 - 2*b^2*c^2 -
 4*a*b^2*c))/(c^4*(4*a*c - b^2)^(1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)**5/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Timed out
```

3.2 $\int \frac{\sin^3(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=76

$$-\frac{\left(b^2-2c(a+c)\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{c^2\sqrt{b^2-4ac}}-\frac{b\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2c^2}+\frac{\cos(x)}{c}$$

```
[Out] cos(x)/c-1/2*b*ln(a+b*cos(x)+c*cos(x)^2)/c^2-(b^2-2*c*(a+c))*arctanh((b+2*c
*cos(x))/(-4*a*c+b^2)^(1/2))/c^2/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {3259, 1657, 634, 618, 206, 628}

$$-\frac{\left(b^2-2c(a+c)\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{c^2\sqrt{b^2-4ac}}-\frac{b\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2c^2}+\frac{\cos(x)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]^3/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] -(((b^2 - 2*c*(a + c))*ArcTanh[(b + 2*c*Cos[x])/Sqrt[b^2 - 4*a*c]])/(c^2*Sq
rt[b^2 - 4*a*c])) + Cos[x]/c - (b*Log[a + b*Cos[x] + c*Cos[x]^2])/(2*c^2)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 1657

```
Int[(Pq_)*((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[Expand
Integrand[Pq*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c}, x] && PolyQ[Pq
, x] && IGtQ[p, -2]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$\int \frac{\sin^3(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = -\text{Subst}\left(\int \frac{1-x^2}{a+bx+cx^2}\,dx, x, \cos(x)\right)$$

$$= -\text{Subst}\left(\int \left(-\frac{1}{c}+\frac{a+c+bx}{c\left(a+bx+cx^2\right)}\right)dx, x, \cos(x)\right)$$

$$= \frac{\cos(x)}{c} - \frac{\text{Subst}\left(\int \frac{a+c+bx}{a+bx+cx^2}\,dx, x, \cos(x)\right)}{c}$$

$$= \frac{\cos(x)}{c} - \frac{b\,\text{Subst}\left(\int \frac{b+2cx}{a+bx+cx^2}\,dx, x, \cos(x)\right)}{2c^2} + \frac{\left(b^2-2c(a+c)\right)\text{Subst}\left(\int \frac{1}{a+bx+cx^2}\right.}{2c^2}$$

$$= \frac{\cos(x)}{c} - \frac{b\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2c^2} - \frac{\left(b^2-2c(a+c)\right)\text{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\right.}{c^2}$$

$$= -\frac{\left(b^2-2c(a+c)\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{c^2\sqrt{b^2-4ac}} + \frac{\cos(x)}{c} - \frac{b\log\left(a+b\cos(x)+c\cos^2(x)\right.}{2c^2}$$

Mathematica [A] time = 0.27, size = 131, normalized size = 1.72

$$\frac{2c\cos(x)\sqrt{b^2-4ac}+\left(-b\sqrt{b^2-4ac}-2c(a+c)+b^2\right)\log\left(\sqrt{b^2-4ac}-b-2c\cos(x)\right)-\left(b\sqrt{b^2-4ac}-2c(a+c\right.}{2c^2\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]^3/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (2*c*Sqrt[b^2 - 4*a*c]*Cos[x] + (b^2 - 2*c*(a + c) - b*Sqrt[b^2 - 4*a*c])*L
og[-b + Sqrt[b^2 - 4*a*c] - 2*c*Cos[x]] - (b^2 - 2*c*(a + c) + b*Sqrt[b^2 -
 4*a*c])*Log[b + Sqrt[b^2 - 4*a*c] + 2*c*Cos[x]])/(2*c^2*Sqrt[b^2 - 4*a*c])
```

fricas [A] time = 2.26, size = 258, normalized size = 3.39

$$\left[-\frac{\left(b^2-2\,ac-2\,c^2\right)\sqrt{b^2-4\,ac}\,\log\left(-\frac{2\,c^2\cos(x)^2+2\,bc\cos(x)+b^2-2\,ac+\sqrt{b^2-4\,ac}\,(2\,c\cos(x)+b)}{c\cos(x)^2+b\cos(x)+a}\right)-2\left(b^2c-4\,ac^2\right)\cos(x)+\left(b^3\right.}{2\left(b^2c^2-4\,ac^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] [-1/2*((b^2 - 2*a*c - 2*c^2)*sqrt(b^2 - 4*a*c)*log(-(2*c^2*cos(x)^2 + 2*b*c
*cos(x) + b^2 - 2*a*c + sqrt(b^2 - 4*a*c)*(2*c*cos(x) + b))/(c*cos(x)^2 + b
*cos(x) + a)) - 2*(b^2*c - 4*a*c^2)*cos(x) + (b^3 - 4*a*b*c)*log(c*cos(x)^2
 + b*cos(x) + a))/(b^2*c^2 - 4*a*c^3), -1/2*(2*(b^2 - 2*a*c - 2*c^2)*sqrt(-
b^2 + 4*a*c)*arctan(-sqrt(-b^2 + 4*a*c)*(2*c*cos(x) + b)/(b^2 - 4*a*c)) - 2
*(b^2*c - 4*a*c^2)*cos(x) + (b^3 - 4*a*b*c)*log(c*cos(x)^2 + b*cos(x) + a))
/(b^2*c^2 - 4*a*c^3)]
```

giac [A] time = 0.38, size = 76, normalized size = 1.00

$$\frac{\cos(x)}{c}-\frac{b\log\left(c\cos(x)^2+b\cos(x)+a\right)}{2\,c^2}+\frac{\left(b^2-2\,ac-2\,c^2\right)\arctan\left(\frac{2\,c\cos(x)+b}{\sqrt{-b^2+4\,ac}}\right)}{\sqrt{-b^2+4\,ac}\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] cos(x)/c - 1/2*b*log(c*cos(x)^2 + b*cos(x) + a)/c^2 + (b^2 - 2*a*c - 2*c^2)
*arctan((2*c*cos(x) + b)/sqrt(-b^2 + 4*a*c))/(sqrt(-b^2 + 4*a*c)*c^2)
```

maple [A] time = 0.08, size = 141, normalized size = 1.86

$$\frac{\cos(x)}{c}-\frac{b\ln\left(a+b\cos(x)+c\left(\cos^2(x)\right)\right)}{2c^2}-\frac{2\arctan\left(\frac{b+2c\cos(x)}{\sqrt{4ca-b^2}}\right)a}{c\sqrt{4ca-b^2}}-\frac{2\arctan\left(\frac{b+2c\cos(x)}{\sqrt{4ca-b^2}}\right)}{\sqrt{4ca-b^2}}+\frac{\arctan\left(\frac{b+2c\cos(x)}{\sqrt{4ca-b^2}}\right)b^2}{c^2\sqrt{4ca-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)^3/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] cos(x)/c-1/2*b*ln(a+b*cos(x)+c*cos(x)^2)/c^2-2/c/(4*a*c-b^2)^(1/2)*arctan((
b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*a-2/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x)
)/(4*a*c-b^2)^(1/2))+1/c^2/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b
^2)^(1/2))*b^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 0.19, size = 226, normalized size = 2.97

$$\frac{\cos(x)}{c}-\frac{2\,\mathrm{atan}\left(\frac{b}{\sqrt{4\,a\,c-b^2}}+\frac{2\,c\,\cos(x)}{\sqrt{4\,a\,c-b^2}}\right)}{\sqrt{4\,a\,c-b^2}}+\frac{b^3\,\ln\left(c\cos(x)^2+b\,\cos(x)+a\right)}{2\,\left(4\,a\,c^3-b^2\,c^2\right)}+\frac{b^2\,\mathrm{atan}\left(\frac{b}{\sqrt{4\,a\,c-b^2}}+\frac{2\,c\,\cos(x)}{\sqrt{4\,a\,c-b^2}}\right)}{c^2\,\sqrt{4\,a\,c-b^2}}-\frac{2\,a\,\mathrm{atan}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)^3/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] cos(x)/c - (2*atan(b/(4*a*c - b^2)^(1/2) + (2*c*cos(x))/(4*a*c - b^2)^(1/2)
))/(4*a*c - b^2)^(1/2) + (b^3*log(a + b*cos(x) + c*cos(x)^2))/(2*(4*a*c^3 -
 b^2*c^2)) + (b^2*atan(b/(4*a*c - b^2)^(1/2) + (2*c*cos(x))/(4*a*c - b^2)^(
1/2)))/(c^2*(4*a*c - b^2)^(1/2)) - (2*a*atan(b/(4*a*c - b^2)^(1/2) + (2*c*c
os(x))/(4*a*c - b^2)^(1/2)))/(c*(4*a*c - b^2)^(1/2)) - (2*a*b*c*log(a + b*c
os(x) + c*cos(x)^2))/(4*a*c^3 - b^2*c^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)**3/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Timed out
```

3.3 $\int \frac{\sin(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=35

$$\frac{2\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{\sqrt{b^2-4ac}}$$

```
[Out] 2*arctanh((b+2*c*cos(x))/(-4*a*c+b^2)^(1/2))/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {3259, 618, 206}

$$\frac{2\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (2*ArcTanh[(b + 2*c*Cos[x])/Sqrt[b^2 - 4*a*c]])/Sqrt[b^2 - 4*a*c]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$\int \frac{\sin(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = -\operatorname{Subst}\left(\int \frac{1}{a+bx+cx^2}\,dx, x, \cos(x)\right)$$
$$= 2\operatorname{Subst}\left(\int \frac{1}{b^2-4ac-x^2}\,dx, x, b+2c\cos(x)\right)$$
$$= \frac{2\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{\sqrt{b^2-4ac}}$$

Mathematica [A] time = 0.03, size = 39, normalized size = 1.11

$$-\frac{2\tan^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{4ac-b^2}}\right)}{\sqrt{4ac-b^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (-2*ArcTan[(b + 2*c*Cos[x])/Sqrt[-b^2 + 4*a*c]])/Sqrt[-b^2 + 4*a*c]
```

fricas [A] time = 1.77, size = 126, normalized size = 3.60

$$\left[\frac{\log\left(-\frac{2\,c^2\cos(x)^2+2\,bc\cos(x)+b^2-2\,ac+\sqrt{b^2-4\,ac}\,(2\,c\cos(x)+b)}{c\cos(x)^2+b\cos(x)+a}\right)}{\sqrt{b^2-4\,ac}}, \frac{2\sqrt{-b^2+4\,ac}\,\arctan\left(-\frac{\sqrt{-b^2+4\,ac}\,(2\,c\cos(x)+b)}{b^2-4\,ac}\right)}{b^2-4\,ac}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] [log(-(2*c^2*cos(x)^2 + 2*b*c*cos(x) + b^2 - 2*a*c + sqrt(b^2 - 4*a*c)*(2*c
*cos(x) + b))/(c*cos(x)^2 + b*cos(x) + a))/sqrt(b^2 - 4*a*c), 2*sqrt(-b^2 +
 4*a*c)*arctan(-sqrt(-b^2 + 4*a*c)*(2*c*cos(x) + b)/(b^2 - 4*a*c))/(b^2 - 4
*a*c)]
```

giac [A] time = 0.33, size = 35, normalized size = 1.00

$$-\frac{2\arctan\left(\frac{2\,c\cos(x)+b}{\sqrt{-b^2+4\,ac}}\right)}{\sqrt{-b^2+4\,ac}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] -2*arctan((2*c*cos(x) + b)/sqrt(-b^2 + 4*a*c))/sqrt(-b^2 + 4*a*c)
```

maple [A] time = 0.06, size = 36, normalized size = 1.03

$$-\frac{2\arctan\left(\frac{b+2c\cos(x)}{\sqrt{4ca-b^2}}\right)}{\sqrt{4ca-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] -2/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 2.42, size = 47, normalized size = 1.34

$$-\frac{2\,\mathrm{atan}\left(\frac{b}{\sqrt{4\,a\,c-b^2}}+\frac{2\,c\,\cos(x)}{\sqrt{4\,a\,c-b^2}}\right)}{\sqrt{4\,a\,c-b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] -(2*atan(b/(4*a*c - b^2)^(1/2) + (2*c*cos(x))/(4*a*c - b^2)^(1/2)))/(4*a*c
- b^2)^(1/2)
```

sympy [A] time = 2.95, size = 99, normalized size = 2.83

$$\begin{cases} \frac{2}{b+2c\cos(x)} & \text{for } a = \frac{b^2}{4c} \\ -\frac{\log\left(\frac{a}{b}+\cos(x)\right)}{b} & \text{for } c = 0 \\ -\frac{\log\left(\frac{b}{2c}+\cos(x)-\frac{\sqrt{-4ac+b^2}}{2c}\right)}{\sqrt{-4ac+b^2}} + \frac{\log\left(\frac{b}{2c}+\cos(x)+\frac{\sqrt{-4ac+b^2}}{2c}\right)}{\sqrt{-4ac+b^2}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Piecewise((2/(b + 2*c*cos(x)), Eq(a, b**2/(4*c))), (-log(a/b + cos(x))/b, E
q(c, 0)), (-log(b/(2*c) + cos(x) - sqrt(-4*a*c + b**2)/(2*c))/sqrt(-4*a*c +
 b**2) + log(b/(2*c) + cos(x) + sqrt(-4*a*c + b**2)/(2*c))/sqrt(-4*a*c + b*
*2), True))
```

3.4 $\int \frac{\csc(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=129

$$-\frac{\left(-2ac+b^2-2c^2\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{(a-b+c)(a+b+c)\sqrt{b^2-4ac}}+\frac{b\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2(a-b+c)(a+b+c)}+\frac{\log(1-\cos(x))}{2(a+b+c)}-\frac{\log(\cos(x)+1)}{2(a-b+c)}$$

```
[Out] 1/2*ln(1-cos(x))/(a+b+c)-1/2*ln(1+cos(x))/(a-b+c)+1/2*b*ln(a+b*cos(x)+c*cos
(x)^2)/(a-b+c)/(a+b+c)-(-2*a*c+b^2-2*c^2)*arctanh((b+2*c*cos(x))/(-4*a*c+b^
2)^(1/2))/(a-b+c)/(a+b+c)/(-4*a*c+b^2)^(1/2)
```

Rubi [A] time = 0.17, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.471, Rules used = {3259, 981, 634, 618, 206, 628, 633, 31}

$$-\frac{\left(-2ac+b^2-2c^2\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{(a-b+c)(a+b+c)\sqrt{b^2-4ac}}+\frac{b\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2(a-b+c)(a+b+c)}+\frac{\log(1-\cos(x))}{2(a+b+c)}-\frac{\log(\cos(x)+1)}{2(a-b+c)}$$

Antiderivative was successfully verified.

```
[In] Int[Csc[x]/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] -(((b^2 - 2*a*c - 2*c^2)*ArcTanh[(b + 2*c*Cos[x])/Sqrt[b^2 - 4*a*c]])/((a -
 b + c)*(a + b + c)*Sqrt[b^2 - 4*a*c])) + Log[1 - Cos[x]]/(2*(a + b + c)) -
 Log[1 + Cos[x]]/(2*(a - b + c)) + (b*Log[a + b*Cos[x] + c*Cos[x]^2])/(2*(a
 - b + c)*(a + b + c))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 633

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> With[{q = Rt[-(
a*c), 2]}, Dist[e/2 + (c*d)/(2*q), Int[1/(-q + c*x), x], x] + Dist[e/2 - (c
*d)/(2*q), Int[1/(q + c*x), x], x]] /; FreeQ[{a, c, d, e}, x] && NiceSqrtQ[
-(a*c)]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 981

```
Int[1/(((a_) + (b_.)*(x_) + (c_.)*(x_)^2)*((d_) + (f_.)*(x_)^2)), x_Symbol]
 :> With[{q = c^2*d^2 + b^2*d*f - 2*a*c*d*f + a^2*f^2}, Dist[1/q, Int[(c^2*
d + b^2*f - a*c*f + b*c*f*x)/(a + b*x + c*x^2), x], x] - Dist[1/q, Int[(c*d
*f - a*f^2 + b*f^2*x)/(d + f*x^2), x], x] /; NeQ[q, 0]] /; FreeQ[{a, b, c,
d, f}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$\int \frac{\csc(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = -\text{Subst}\left(\int \frac{1}{(1-x^2)(a+bx+cx^2)}\,dx, x, \cos(x)\right)$$
$$= \frac{\text{Subst}\left(\int \frac{-a-c+bx}{1-x^2}\,dx, x, \cos(x)\right)}{(a-b+c)(a+b+c)} - \frac{\text{Subst}\left(\int \frac{-b^2+ac+c^2-bcx}{a+bx+cx^2}\,dx, x, \cos(x)\right)}{(a-b+c)(a+b+c)}$$
$$= \frac{\text{Subst}\left(\int \frac{1}{-1-x}\,dx, x, \cos(x)\right)}{2(a-b+c)} - \frac{\text{Subst}\left(\int \frac{1}{1-x}\,dx, x, \cos(x)\right)}{2(a+b+c)} + \frac{b\,\text{Subst}\left(\int \frac{b+2c\text{:}}{a+bx+c}\right.}{2(a-b+c)}$$
$$= \frac{\log(1-\cos(x))}{2(a+b+c)} - \frac{\log(1+\cos(x))}{2(a-b+c)} + \frac{b\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2(a-b+c)(a+b+c)} - \frac{(b^2-2}{}$$
$$= -\frac{\left(b^2-2c(a+c)\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{(a-b+c)(a+b+c)\sqrt{b^2-4ac}} + \frac{\log(1-\cos(x))}{2(a+b+c)} - \frac{\log(1+\cos(x))}{2(a-b+c)} + \frac{b}{}$$

Mathematica [A] time = 0.20, size = 126, normalized size = 0.98

$$-\frac{\sqrt{4ac-b^2}\left(-b\log\left(a+b\cos(x)+c\cos^2(x)\right)-((a-b+c)\log(1-\cos(x)))+(a+b+c)\log(\cos(x)+1)\right)+(4}{2(a-b+c)(a+b+c)\sqrt{4ac-b^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Csc[x]/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] -1/2*((-2*b^2 + 4*c*(a + c))*ArcTan[(b + 2*c*Cos[x])/Sqrt[-b^2 + 4*a*c]] +
Sqrt[-b^2 + 4*a*c]*(-((a - b + c)*Log[1 - Cos[x]]) + (a + b + c)*Log[1 + Co
s[x]] - b*Log[a + b*Cos[x] + c*Cos[x]^2]))/((a - b + c)*(a + b + c)*Sqrt[-b
^2 + 4*a*c])
```

fricas [A] time = 3.29, size = 470, normalized size = 3.64

$$\left[-\frac{\left(b^2-2\,ac-2\,c^2\right)\sqrt{b^2-4\,ac}\,\log\left(-\frac{2\,c^2\cos(x)^2+2\,bc\cos(x)+b^2-2\,ac+\sqrt{b^2-4\,ac}\,(2\,c\cos(x)+b)}{c\cos(x)^2+b\cos(x)+a}\right)-\left(b^3-4\,abc\right)\log\left(c\cos(x)^2\right.}{2\left(a^2b^2-b^4\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] [-1/2*((b^2 - 2*a*c - 2*c^2)*sqrt(b^2 - 4*a*c)*log(-(2*c^2*cos(x)^2 + 2*b*c
*cos(x) + b^2 - 2*a*c + sqrt(b^2 - 4*a*c)*(2*c*cos(x) + b))/(c*cos(x)^2 + b
*cos(x) + a)) - (b^3 - 4*a*b*c)*log(c*cos(x)^2 + b*cos(x) + a) + (a*b^2 + b
^3 - 4*a*c^2 - (4*a^2 + 4*a*b - b^2)*c)*log(1/2*cos(x) + 1/2) - (a*b^2 - b^
3 - 4*a*c^2 - (4*a^2 - 4*a*b - b^2)*c)*log(-1/2*cos(x) + 1/2))/(a^2*b^2 - b
^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c), -1/2*(2*(b^2 - 2
*a*c - 2*c^2)*sqrt(-b^2 + 4*a*c)*arctan(-sqrt(-b^2 + 4*a*c)*(2*c*cos(x) + b
)/(b^2 - 4*a*c)) - (b^3 - 4*a*b*c)*log(c*cos(x)^2 + b*cos(x) + a) + (a*b^2
+ b^3 - 4*a*c^2 - (4*a^2 + 4*a*b - b^2)*c)*log(1/2*cos(x) + 1/2) - (a*b^2 -
 b^3 - 4*a*c^2 - (4*a^2 - 4*a*b - b^2)*c)*log(-1/2*cos(x) + 1/2))/(a^2*b^2
- b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)]
```

giac [A] time = 0.27, size = 130, normalized size = 1.01

$$\frac{b\log\left(c\cos(x)^2+b\cos(x)+a\right)}{2\left(a^2-b^2+2\,ac+c^2\right)}+\frac{\left(b^2-2\,ac-2\,c^2\right)\arctan\left(\frac{2\,c\cos(x)+b}{\sqrt{-b^2+4\,ac}}\right)}{\left(a^2-b^2+2\,ac+c^2\right)\sqrt{-b^2+4\,ac}}-\frac{\log\left(\cos(x)+1\right)}{2\,(a-b+c)}+\frac{\log\left(-\cos(x)+1\right)}{2\,(a+b+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] 1/2*b*log(c*cos(x)^2 + b*cos(x) + a)/(a^2 - b^2 + 2*a*c + c^2) + (b^2 - 2*a
*c - 2*c^2)*arctan((2*c*cos(x) + b)/sqrt(-b^2 + 4*a*c))/((a^2 - b^2 + 2*a*c
 + c^2)*sqrt(-b^2 + 4*a*c)) - 1/2*log(cos(x) + 1)/(a - b + c) + 1/2*log(-co
s(x) + 1)/(a + b + c)
```

maple [A] time = 0.12, size = 223, normalized size = 1.73

$$\frac{b\ln\left(a+b\cos(x)+c\left(\cos^2(x)\right)\right)}{2\,(a-b+c)\,(a+b+c)}-\frac{2\arctan\left(\frac{b+2c\cos(x)}{\sqrt{4ca-b^2}}\right)ca}{(a-b+c)\,(a+b+c)\,\sqrt{4ca-b^2}}+\frac{\arctan\left(\frac{b+2c\cos(x)}{\sqrt{4ca-b^2}}\right)b^2}{(a-b+c)\,(a+b+c)\,\sqrt{4ca-b^2}}-\frac{2\,\mathrm{arc}}{(a-b+c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(csc(x)/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 1/2*b*ln(a+b*cos(x)+c*cos(x)^2)/(a-b+c)/(a+b+c)-2/(a-b+c)/(a+b+c)/(4*a*c-b^
2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*c*a+1/(a-b+c)/(a+b+c)/(4*
a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*b^2-2/(a-b+c)/(a+b+
c)/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*c^2+1/(2*a+2*
b+2*c)*ln(-1+cos(x))-1/(2*a-2*b+2*c)*ln(cos(x)+1)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [B] time = 4.97, size = 1003, normalized size = 7.78

$$\frac{\ln\left(\cos(x)-1\right)}{2\,\left(a+b+c\right)}-\frac{\ln\left(\cos(x)+1\right)}{2\,\left(a-b+c\right)}-\frac{\ln\left(b\,c^2+4\,c^3\,\cos(x)+\frac{\left(a\,\left(4\,b\,c-2\,c\,\sqrt{b^2-4\,a\,c}\right)-b^3+b^2\,\sqrt{b^2-4\,a\,c}-2\,c^2\,\sqrt{b^2-4\,a\,c}\right)\left(8\,a\,c^3+\cos(x\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(sin(x)*(a + b*cos(x) + c*cos(x)^2)),x)
```

```
[Out] log(cos(x) - 1)/(2*(a + b + c)) - log(cos(x) + 1)/(2*(a - b + c)) - (log(b*
c^2 + 4*c^3*cos(x) + ((a*(4*b*c - 2*c*(b^2 - 4*a*c)^(1/2)) - b^3 + b^2*(b^2
 - 4*a*c)^(1/2) - 2*c^2*(b^2 - 4*a*c)^(1/2))*(8*a*c^3 + cos(x)*(12*b*c^3 -
3*b^3*c + 12*a*b*c^2) + 4*c^4 + 4*a^2*c^2 + 3*b^2*c^2 - ((a*(4*b*c - 2*c*(b
^2 - 4*a*c)^(1/2)) - b^3 + b^2*(b^2 - 4*a*c)^(1/2) - 2*c^2*(b^2 - 4*a*c)^(1
/2))*(4*b*c^4 + 4*b^3*c^2 + cos(x)*(8*a*c^4 + 6*b^4*c + 8*c^5 - 8*a^2*c^3 -
 8*a^3*c^2 - 6*b^2*c^3 - 20*a*b^2*c^2 + 2*a^2*b^2*c) - 28*a^2*b*c^2 - 24*a*
b*c^3 + 8*a*b^3*c))/(b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c +
2*a^2 + 2*c^2)) - a*b^2*c))/(b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(
4*a*c + 2*a^2 + 2*c^2)))*(a*(4*b*c - 2*c*(b^2 - 4*a*c)^(1/2)) - b^3 + b^2*(
b^2 - 4*a*c)^(1/2) - 2*c^2*(b^2 - 4*a*c)^(1/2)))/(b^2*(12*a*c + 2*a^2 - 2*b
^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2)) - (log(b*c^2 + 4*c^3*cos(x) +
((a*(4*b*c + 2*c*(b^2 - 4*a*c)^(1/2)) - b^3 - b^2*(b^2 - 4*a*c)^(1/2) + 2*c
^2*(b^2 - 4*a*c)^(1/2))*(8*a*c^3 + cos(x)*(12*b*c^3 - 3*b^3*c + 12*a*b*c^2)
 + 4*c^4 + 4*a^2*c^2 + 3*b^2*c^2 - ((a*(4*b*c + 2*c*(b^2 - 4*a*c)^(1/2)) -
b^3 - b^2*(b^2 - 4*a*c)^(1/2) + 2*c^2*(b^2 - 4*a*c)^(1/2))*(4*b*c^4 + 4*b^3
*c^2 + cos(x)*(8*a*c^4 + 6*b^4*c + 8*c^5 - 8*a^2*c^3 - 8*a^3*c^2 - 6*b^2*c^
3 - 20*a*b^2*c^2 + 2*a^2*b^2*c) - 28*a^2*b*c^2 - 24*a*b*c^3 + 8*a*b^3*c))/(
b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2)) - a*b
^2*c))/(b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2
)))*(a*(4*b*c + 2*c*(b^2 - 4*a*c)^(1/2)) - b^3 - b^2*(b^2 - 4*a*c)^(1/2) +
2*c^2*(b^2 - 4*a*c)^(1/2)))/(b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(
4*a*c + 2*a^2 + 2*c^2))
```

<u>**sympy**</u> **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\csc(x)}{a + b\cos(x) + c\cos^2(x)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Integral(csc(x)/(a + b*cos(x) + c*cos(x)**2), x)
```

3.5 $\int \frac{\csc^3(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=205

$$-\frac{b\left(b^2-2c(a+c)\right)\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2\left(a^2+2ac-b^2+c^2\right)^2}+\frac{\left(-2b^2c(2a+c)+2c^2(a+c)^2+b^4\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{\sqrt{b^2-4ac}\left(a^2+2ac-b^2+c^2\right)^2}+(a+$$

```
[Out] 1/2*(b-(a+c)*cos(x))*csc(x)^2/(a-b+c)/(a+b+c)+1/4*(a+2*b+3*c)*ln(1-cos(x))/
(a+b+c)^2-1/4*(a-2*b+3*c)*ln(1+cos(x))/(a-b+c)^2-1/2*b*(b^2-2*c*(a+c))*ln(a
+b*cos(x)+c*cos(x)^2)/(a^2+2*a*c-b^2+c^2)^2+(b^4+2*c^2*(a+c)^2-2*b^2*c*(2*a
+c))*arctanh((b+2*c*cos(x))/(-4*a*c+b^2)^(1/2))/(a^2+2*a*c-b^2+c^2)^2/(-4*a
*c+b^2)^(1/2)
```

Rubi [A] time = 0.46, antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.474, Rules used = {3259, 976, 1074, 634, 618, 206, 628, 633, 31}

$$-\frac{b\left(b^2-2c(a+c)\right)\log\left(a+b\cos(x)+c\cos^2(x)\right)}{2\left(a^2+2ac-b^2+c^2\right)^2}+\frac{\left(-2b^2c(2a+c)+2c^2(a+c)^2+b^4\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{\sqrt{b^2-4ac}\left(a^2+2ac-b^2+c^2\right)^2}+(a+$$

Antiderivative was successfully verified.

```
[In] Int[Csc[x]^3/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] ((b^4 + 2*c^2*(a + c)^2 - 2*b^2*c*(2*a + c))*ArcTanh[(b + 2*c*Cos[x])/Sqrt[
b^2 - 4*a*c]])/(Sqrt[b^2 - 4*a*c]*(a^2 - b^2 + 2*a*c + c^2)^2) + ((b - (a +
 c)*Cos[x])*Csc[x]^2)/(2*(a - b + c)*(a + b + c)) + ((a + 2*b + 3*c)*Log[1
- Cos[x]])/(4*(a + b + c)^2) - ((a - 2*b + 3*c)*Log[1 + Cos[x]])/(4*(a - b
+ c)^2) - (b*(b^2 - 2*c*(a + c))*Log[a + b*Cos[x] + c*Cos[x]^2])/(2*(a^2 -
b^2 + 2*a*c + c^2)^2)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 633

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> With[{q = Rt[-(
a*c), 2]}, Dist[e/2 + (c*d)/(2*q), Int[1/(-q + c*x), x], x] + Dist[e/2 - (c
*d)/(2*q), Int[1/(q + c*x), x], x]] /; FreeQ[{a, c, d, e}, x] && NiceSqrtQ[
-(a*c)]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 976

```
Int[((a_.) + (c_.)*(x_)^2)^(p_)*((d_.) + (e_.)*(x_) + (f_.)*(x_)^2)^(q_), x
_Symbol] :> Simp[((2*a*c^2*e + c*(2*c^2*d - c*(2*a*f))*x)*(a + c*x^2)^(p +
1)*(d + e*x + f*x^2)^(q + 1))/((-4*a*c)*(a*c*e^2 + (c*d - a*f)^2)*(p + 1)),
 x] - Dist[1/((-4*a*c)*(a*c*e^2 + (c*d - a*f)^2)*(p + 1)), Int[(a + c*x^2)^
(p + 1)*(d + e*x + f*x^2)^q*Simp[2*c*((c*d - a*f)^2 - (-(a*e))*(c*e))*(p +
1) - (2*c^2*d - c*(2*a*f))*(a*f*(p + 1) - c*d*(p + 2)) - e*(-2*a*c^2*e)*(p
+ q + 2) + (2*f*(2*a*c^2*e)*(p + q + 2) - (2*c^2*d - c*(2*a*f))*(-(c*e*(2*p
 + q + 4))))*x + c*f*(2*c^2*d - c*(2*a*f))*(2*p + 2*q + 5)*x^2, x], x], x]
/; FreeQ[{a, c, d, e, f, q}, x] && NeQ[e^2 - 4*d*f, 0] && LtQ[p, -1] && NeQ
[a*c*e^2 + (c*d - a*f)^2, 0] &&  !( !IntegerQ[p] && ILtQ[q, -1]) &&  !IGtQ[
q, 0]
```

Rule 1074

```
Int[((A_.) + (B_.)*(x_) + (C_.)*(x_)^2)/(((a_) + (b_.)*(x_) + (c_.)*(x_)^2)
*((d_) + (f_.)*(x_)^2)), x_Symbol] :> With[{q = c^2*d^2 + b^2*d*f - 2*a*c*d
*f + a^2*f^2}, Dist[1/q, Int[(A*c^2*d - a*c*C*d + A*b^2*f - a*b*B*f - a*A*c
```

```
*f + a^2*C*f + c*(B*c*d - b*C*d + A*b*f - a*B*f)*x)/(a + b*x + c*x^2), x],
x] + Dist[1/q, Int[(c*C*d^2 + b*B*d*f - A*c*d*f - a*C*d*f + a*A*f^2 - f*(B*
c*d - b*C*d + A*b*f - a*B*f)*x)/(d + f*x^2), x], x] /; NeQ[q, 0]] /; FreeQ[
{a, b, c, d, f, A, B, C}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$\int \frac{\csc^3(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = -\operatorname{Subst}\left(\int \frac{1}{\left(1-x^2\right)^2\left(a+bx+cx^2\right)}\,dx,x,\cos(x)\right)$$

$$= \frac{(b-(a+c)\cos(x))\csc^2(x)}{2(a-b+c)(a+b+c)} - \frac{\operatorname{Subst}\left(\int \frac{2\left(a^2-2b^2+3ac+2c^2\right)+2b(a-c)x+2c(a+c)x^2}{\left(1-x^2\right)\left(a+bx+cx^2\right)}\,dx,x,\right.}{4(a-b+c)(a+b+c)}$$

$$= \frac{(b-(a+c)\cos(x))\csc^2(x)}{2(a-b+c)(a+b+c)} - \frac{\operatorname{Subst}\left(\int \frac{-2b^2(a-c)+2ac(a+c)+2c^2(a+c)+2a\left(a^2-2b^2+3ac+2c\right.}{}\right.}{}$$

$$= \frac{(b-(a+c)\cos(x))\csc^2(x)}{2(a-b+c)(a+b+c)} + \frac{(a-2b+3c)\operatorname{Subst}\left(\int \frac{1}{-1-x}\,dx,x,\cos(x)\right)}{4(a-b+c)^2} - \frac{(a+}{}$$

$$= \frac{(b-(a+c)\cos(x))\csc^2(x)}{2(a-b+c)(a+b+c)} + \frac{(a+2b+3c)\log(1-\cos(x))}{4(a+b+c)^2} - \frac{(a-2b+3c)\log}{4(a-b}$$

$$= \frac{\left(b^4+2c^2(a+c)^2-2b^2c(2a+c)\right)\tanh^{-1}\left(\frac{b+2c\cos(x)}{\sqrt{b^2-4ac}}\right)}{(a-b+c)^2(a+b+c)^2\sqrt{b^2-4ac}} + \frac{(b-(a+c)\cos(x))\csc}{2(a-b+c)(a+b+}$$

Mathematica [C] time = 2.33, size = 392, normalized size = 1.91

$$\frac{1}{8}\left(-\frac{4\left(-2b^2c(2a+c)-2bc(a+c)\sqrt{b^2-4ac}+b^3\sqrt{b^2-4ac}+2c^2(a+c)^2+b^4\right)\log\left(\sqrt{b^2-4ac}-b-2c\cos(x)\right.}{\sqrt{b^2-4ac}\left(a^2+2ac-b^2+c^2\right)^2}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Csc[x]^3/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (((16*I)*(b^3 - 2*b*c*(a + c))*x)/((a - b + c)^2*(a + b + c)^2) + ((4*I)*(a
 - 2*b + 3*c)*ArcTan[Tan[x]])/(a - b + c)^2 - ((4*I)*(a + 2*b + 3*c)*ArcTan
[Tan[x]])/(a + b + c)^2 - Csc[x/2]^2/(a + b + c) - (2*(a - 2*b + 3*c)*Log[C
os[x/2]^2])/(a - b + c)^2 - (4*(b^4 + 2*c^2*(a + c)^2 - 2*b^2*c*(2*a + c) +
 b^3*Sqrt[b^2 - 4*a*c] - 2*b*c*(a + c)*Sqrt[b^2 - 4*a*c])*Log[-b + Sqrt[b^2
 - 4*a*c] - 2*c*Cos[x]])/(Sqrt[b^2 - 4*a*c]*(a^2 - b^2 + 2*a*c + c^2)^2) -
(4*(-b^4 - 2*c^2*(a + c)^2 + 2*b^2*c*(2*a + c) + b^3*Sqrt[b^2 - 4*a*c] - 2*
b*c*(a + c)*Sqrt[b^2 - 4*a*c])*Log[b + Sqrt[b^2 - 4*a*c] + 2*c*Cos[x]])/(Sq
rt[b^2 - 4*a*c]*(a^2 - b^2 + 2*a*c + c^2)^2) + (2*(a + 2*b + 3*c)*Log[Sin[x
/2]^2])/(a + b + c)^2 + Sec[x/2]^2/(a - b + c))/8
```

fricas [B] time = 18.12, size = 1991, normalized size = 9.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] [1/4*(2*a^2*b^3 - 2*b^5 - 8*a*b*c^3 - 2*(8*a^2*b - b^3)*c^2 + 2*(b^4 - 4*a*
b^2*c + 4*a*c^3 + 2*c^4 + 2*(a^2 - b^2)*c^2 - (b^4 - 4*a*b^2*c + 4*a*c^3 +
2*c^4 + 2*(a^2 - b^2)*c^2)*cos(x)^2)*sqrt(b^2 - 4*a*c)*log(-(2*c^2*cos(x)^2
 + 2*b*c*cos(x) + b^2 - 2*a*c + sqrt(b^2 - 4*a*c)*(2*c*cos(x) + b))/(c*cos(
x)^2 + b*cos(x) + a)) - 4*(2*a^3*b - 3*a*b^3)*c - 2*(a^3*b^2 - a*b^4 - 4*a*
c^4 - (12*a^2 - b^2)*c^3 - (12*a^3 - 7*a*b^2)*c^2 - (4*a^4 - 7*a^2*b^2 + b^
4)*c)*cos(x) - 2*(b^5 - 6*a*b^3*c + 8*a*b*c^3 + 2*(4*a^2*b - b^3)*c^2 - (b^
5 - 6*a*b^3*c + 8*a*b*c^3 + 2*(4*a^2*b - b^3)*c^2)*cos(x)^2)*log(c*cos(x)^2
 + b*cos(x) + a) - (a^3*b^2 - 3*a*b^4 - 2*b^5 - 12*a*c^4 - (28*a^2 + 16*a*b
 - 3*b^2)*c^3 - (20*a^3 + 16*a^2*b - 11*a*b^2 - 4*b^3)*c^2 - (a^3*b^2 - 3*a
*b^4 - 2*b^5 - 12*a*c^4 - (28*a^2 + 16*a*b - 3*b^2)*c^3 - (20*a^3 + 16*a^2*
b - 11*a*b^2 - 4*b^3)*c^2 - (4*a^4 - 17*a^2*b^2 - 12*a*b^3 + b^4)*c)*cos(x)
^2 - (4*a^4 - 17*a^2*b^2 - 12*a*b^3 + b^4)*c)*log(1/2*cos(x) + 1/2) + (a^3*
b^2 - 3*a*b^4 + 2*b^5 - 12*a*c^4 - (28*a^2 - 16*a*b - 3*b^2)*c^3 - (20*a^3
- 16*a^2*b - 11*a*b^2 + 4*b^3)*c^2 - (a^3*b^2 - 3*a*b^4 + 2*b^5 - 12*a*c^4
- (28*a^2 - 16*a*b - 3*b^2)*c^3 - (20*a^3 - 16*a^2*b - 11*a*b^2 + 4*b^3)*c^
2 - (4*a^4 - 17*a^2*b^2 + 12*a*b^3 + b^4)*c)*cos(x)^2 - (4*a^4 - 17*a^2*b^2
 + 12*a*b^3 + b^4)*c)*log(-1/2*cos(x) + 1/2))/(a^4*b^2 - 2*a^2*b^4 + b^6 -
4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b
^2 + b^4)*c^2 - (a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 -
 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3
*b^2 + 2*a*b^4)*c)*cos(x)^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c), 1/4*(2*a^2*
b^3 - 2*b^5 - 8*a*b*c^3 - 2*(8*a^2*b - b^3)*c^2 + 4*(b^4 - 4*a*b^2*c + 4*a*
```

```
c^3 + 2*c^4 + 2*(a^2 - b^2)*c^2 - (b^4 - 4*a*b^2*c + 4*a*c^3 + 2*c^4 + 2*(a
^2 - b^2)*c^2)*cos(x)^2)*sqrt(-b^2 + 4*a*c)*arctan(-sqrt(-b^2 + 4*a*c)*(2*c
*cos(x) + b)/(b^2 - 4*a*c)) - 4*(2*a^3*b - 3*a*b^3)*c - 2*(a^3*b^2 - a*b^4
- 4*a*c^4 - (12*a^2 - b^2)*c^3 - (12*a^3 - 7*a*b^2)*c^2 - (4*a^4 - 7*a^2*b^
2 + b^4)*c)*cos(x) - 2*(b^5 - 6*a*b^3*c + 8*a*b*c^3 + 2*(4*a^2*b - b^3)*c^2
 - (b^5 - 6*a*b^3*c + 8*a*b*c^3 + 2*(4*a^2*b - b^3)*c^2)*cos(x)^2)*log(c*co
s(x)^2 + b*cos(x) + a) - (a^3*b^2 - 3*a*b^4 - 2*b^5 - 12*a*c^4 - (28*a^2 +
16*a*b - 3*b^2)*c^3 - (20*a^3 + 16*a^2*b - 11*a*b^2 - 4*b^3)*c^2 - (a^3*b^2
 - 3*a*b^4 - 2*b^5 - 12*a*c^4 - (28*a^2 + 16*a*b - 3*b^2)*c^3 - (20*a^3 + 1
6*a^2*b - 11*a*b^2 - 4*b^3)*c^2 - (4*a^4 - 17*a^2*b^2 - 12*a*b^3 + b^4)*c)*
cos(x)^2 - (4*a^4 - 17*a^2*b^2 - 12*a*b^3 + b^4)*c)*log(1/2*cos(x) + 1/2) +
 (a^3*b^2 - 3*a*b^4 + 2*b^5 - 12*a*c^4 - (28*a^2 - 16*a*b - 3*b^2)*c^3 - (2
0*a^3 - 16*a^2*b - 11*a*b^2 + 4*b^3)*c^2 - (a^3*b^2 - 3*a*b^4 + 2*b^5 - 12*
a*c^4 - (28*a^2 - 16*a*b - 3*b^2)*c^3 - (20*a^3 - 16*a^2*b - 11*a*b^2 + 4*b
^3)*c^2 - (4*a^4 - 17*a^2*b^2 + 12*a*b^3 + b^4)*c)*cos(x)^2 - (4*a^4 - 17*a
^2*b^2 + 12*a*b^3 + b^4)*c)*log(-1/2*cos(x) + 1/2))/(a^4*b^2 - 2*a^2*b^4 +
b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11
*a^2*b^2 + b^4)*c^2 - (a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)
*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 -
 3*a^3*b^2 + 2*a*b^4)*c)*cos(x)^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)]
```

giac [A] time = 0.35, size = 378, normalized size = 1.84

$$-\frac{\left(b^3-2\,abc-2\,bc^2\right)\log\left(c\cos(x)^2+b\cos(x)+a\right)}{2\left(a^4-2\,a^2b^2+b^4+4\,a^3c-4\,ab^2c+6\,a^2c^2-2\,b^2c^2+4\,ac^3+c^4\right)}-\frac{(a-2\,b+3\,c)\log\left(\cos(x)+1\right)}{4\left(a^2-2\,ab+b^2+2\,ac-2\,bc+c^2\right)}+\frac{(a}{4\left(a^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] -1/2*(b^3 - 2*a*b*c - 2*b*c^2)*log(c*cos(x)^2 + b*cos(x) + a)/(a^4 - 2*a^2*
b^2 + b^4 + 4*a^3*c - 4*a*b^2*c + 6*a^2*c^2 - 2*b^2*c^2 + 4*a*c^3 + c^4) -
1/4*(a - 2*b + 3*c)*log(cos(x) + 1)/(a^2 - 2*a*b + b^2 + 2*a*c - 2*b*c + c^
2) + 1/4*(a + 2*b + 3*c)*log(-cos(x) + 1)/(a^2 + 2*a*b + b^2 + 2*a*c + 2*b*
c + c^2) - (b^4 - 4*a*b^2*c + 2*a^2*c^2 - 2*b^2*c^2 + 4*a*c^3 + 2*c^4)*arct
an((2*c*cos(x) + b)/sqrt(-b^2 + 4*a*c))/((a^4 - 2*a^2*b^2 + b^4 + 4*a^3*c -
 4*a*b^2*c + 6*a^2*c^2 - 2*b^2*c^2 + 4*a*c^3 + c^4)*sqrt(-b^2 + 4*a*c)) - 1
/2*(a^2*b - b^3 + 2*a*b*c + b*c^2 - (a^3 - a*b^2 + 3*a^2*c - b^2*c + 3*a*c^
2 + c^3)*cos(x))/((a + b + c)^2*(a - b + c)^2*(cos(x) + 1)*(cos(x) - 1))
```

maple [B] time = 0.14, size = 546, normalized size = 2.66

$$\frac{c\ln\left(a+b\cos(x)+c\left(\cos^2(x)\right)\right)ab}{(a-b+c)^2\,(a+b+c)^2}-\frac{\ln\left(a+b\cos(x)+c\left(\cos^2(x)\right)\right)b^3}{2\,(a-b+c)^2\,(a+b+c)^2}+\frac{c^2\ln\left(a+b\cos(x)+c\left(\cos^2(x)\right)\right)b}{(a-b+c)^2\,(a+b+c)^2}-\frac{}{(a-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(csc(x)^3/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 1/(a-b+c)^2/(a+b+c)^2*c*ln(a+b*cos(x)+c*cos(x)^2)*a*b-1/2/(a-b+c)^2/(a+b+c)
^2*ln(a+b*cos(x)+c*cos(x)^2)*b^3+1/(a-b+c)^2/(a+b+c)^2*c^2*ln(a+b*cos(x)+c*
cos(x)^2)*b-2/(a-b+c)^2/(a+b+c)^2/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(
4*a*c-b^2)^(1/2))*a^2*c^2+4/(a-b+c)^2/(a+b+c)^2/(4*a*c-b^2)^(1/2)*arctan((b
+2*c*cos(x))/(4*a*c-b^2)^(1/2))*a*b^2*c-4/(a-b+c)^2/(a+b+c)^2/(4*a*c-b^2)^(
1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*a*c^3-1/(a-b+c)^2/(a+b+c)^2/(
4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*b^4+2/(a-b+c)^2/(
a+b+c)^2/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^(1/2))*b^2*c^2
-2/(a-b+c)^2/(a+b+c)^2/(4*a*c-b^2)^(1/2)*arctan((b+2*c*cos(x))/(4*a*c-b^2)^
(1/2))*c^4+1/(4*a+4*b+4*c)/(-1+cos(x))+1/4/(a+b+c)^2*ln(-1+cos(x))*a+1/2/(a
+b+c)^2*ln(-1+cos(x))*b+3/4/(a+b+c)^2*ln(-1+cos(x))*c+1/(4*a-4*b+4*c)/(cos(
x)+1)-1/4/(a-b+c)^2*ln(cos(x)+1)*a+1/2/(a-b+c)^2*ln(cos(x)+1)*b-3/4/(a-b+c)
^2*ln(cos(x)+1)*c
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(4*a*c-b^2>0)', see `assume?` for mo
re details)Is 4*a*c-b^2 positive or negative?
```

mupad [**B**] time = 18.73, size = 2742, normalized size = 13.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(sin(x)^3*(a + b*cos(x) + c*cos(x)^2)),x)
```

```
[Out] (b/(2*(2*a*c + a^2 - b^2 + c^2)) - (cos(x)*(a + c))/(2*(2*a*c + a^2 - b^2 +
 c^2)))/sin(x)^2 - log(cos(x) + 1)*(1/(4*(a - b + c)) - (b/4 - c/2)/(a - b
+ c)^2) + log(cos(x) - 1)*((b/4 + c/2)/(a + b + c)^2 + 1/(4*(a + b + c))) -
 (log((c^4*(4*a*c + a^2 - 4*b^2 + 3*c^2))/(4*(2*a*c + a^2 - b^2 + c^2)^2) -
 (b*c^5*cos(x))/(2*a*c + a^2 - b^2 + c^2)^2 - (((((c*(a*b^4 + 28*a*c^4 + 4*
a^4*c - 5*b^4*c + 8*c^5 - a^3*b^2 + 36*a^2*c^3 + 20*a^3*c^2 + 5*b^2*c^3 - 3
*a*b^2*c^2 - 9*a^2*b^2*c))/(2*(2*a*c + a^2 - b^2 + c^2)) - (2*c*((b^4*(b^2
- 4*a*c)^(1/2))/2 - b^5/2 + c^4*(b^2 - 4*a*c)^(1/2) + b^3*c^2 + 2*a*c^3*(b^
```

```
2 - 4*a*c)^(1/2) - 4*a^2*b*c^2 + a^2*c^2*(b^2 - 4*a*c)^(1/2) - b^2*c^2*(b^2
 - 4*a*c)^(1/2) - 4*a*b*c^3 + 3*a*b^3*c - 2*a*b^2*c*(b^2 - 4*a*c)^(1/2))*(4
*a*b^3 + 2*b*c^3 + 2*b^3*c + 3*b^4*cos(x) + 4*c^4*cos(x) + 4*a*c^3*cos(x) -
 4*a^3*c*cos(x) + a^2*b^2*cos(x) - 4*a^2*c^2*cos(x) - 3*b^2*c^2*cos(x) - 12
*a*b*c^2 - 14*a^2*b*c - 10*a*b^2*c*cos(x)))/((4*a*c - b^2)*(2*a*c + a^2 - b
^2 + c^2)^2) + (b*c*cos(x)*(36*a*c^3 + 4*a^3*c + 3*b^4 + 16*c^4 - a^2*b^2 +
 24*a^2*c^2 - 13*b^2*c^2 - 18*a*b^2*c))/(2*a*c + a^2 - b^2 + c^2))*((b^4*(b
^2 - 4*a*c)^(1/2))/2 - b^5/2 + c^4*(b^2 - 4*a*c)^(1/2) + b^3*c^2 + 2*a*c^3*
(b^2 - 4*a*c)^(1/2) - 4*a^2*b*c^2 + a^2*c^2*(b^2 - 4*a*c)^(1/2) - b^2*c^2*(
b^2 - 4*a*c)^(1/2) - 4*a*b*c^3 + 3*a*b^3*c - 2*a*b^2*c*(b^2 - 4*a*c)^(1/2))
)/((4*a*c - b^2)*(2*a*c + a^2 - b^2 + c^2)^2) - (b*c*(2*a*b^4 - 20*a*c^4 +
3*a^4*c - 6*b^4*c + 7*c^5 - a^3*b^2 - 26*a^2*c^3 + 4*a^3*c^2 + 23*a*b^2*c^2
 - 6*a^2*b^2*c))/(4*(2*a*c + a^2 - b^2 + c^2)^2) + (c*cos(x)*(64*a*c^5 + 26
*c^6 + a^2*b^4 + 52*a^2*c^4 + 16*a^3*c^3 + 2*a^4*c^2 - 18*b^2*c^4 + 9*b^4*c
^2 - 32*a*b^2*c^3 - 4*a^3*b^2*c - 2*a^2*b^2*c^2 - 2*a*b^4*c))/(4*(2*a*c + a
^2 - b^2 + c^2)^2))*((b^4*(b^2 - 4*a*c)^(1/2))/2 - b^5/2 + c^4*(b^2 - 4*a*c
)^(1/2) + b^3*c^2 + 2*a*c^3*(b^2 - 4*a*c)^(1/2) - 4*a^2*b*c^2 + a^2*c^2*(b^
2 - 4*a*c)^(1/2) - b^2*c^2*(b^2 - 4*a*c)^(1/2) - 4*a*b*c^3 + 3*a*b^3*c - 2*
a*b^2*c*(b^2 - 4*a*c)^(1/2)))/((4*a*c - b^2)*(2*a*c + a^2 - b^2 + c^2)^2))*
(b^3*(3*a*c + c^2) - b^2*(c^2*(b^2 - 4*a*c)^(1/2) + 2*a*c*(b^2 - 4*a*c)^(1/
2)) - b*(4*a*c^3 + 4*a^2*c^2) - b^5/2 + (b^4*(b^2 - 4*a*c)^(1/2))/2 + c^4*(
b^2 - 4*a*c)^(1/2) + 2*a*c^3*(b^2 - 4*a*c)^(1/2) + a^2*c^2*(b^2 - 4*a*c)^(1
/2)))/(4*a*c^5 + 4*a^5*c - b^6 + 2*a^2*b^4 - a^4*b^2 + 16*a^2*c^4 + 24*a^3*
c^3 + 16*a^4*c^2 - b^2*c^4 + 2*b^4*c^2 - 12*a*b^2*c^3 - 12*a^3*b^2*c - 22*a
^2*b^2*c^2 + 8*a*b^4*c) + (log((c^4*(4*a*c + a^2 - 4*b^2 + 3*c^2))/(4*(2*a*
c + a^2 - b^2 + c^2)^2) - (b*c^5*cos(x))/(2*a*c + a^2 - b^2 + c^2)^2 - ((((
(c*(a*b^4 + 28*a*c^4 + 4*a^4*c - 5*b^4*c + 8*c^5 - a^3*b^2 + 36*a^2*c^3 + 2
0*a^3*c^2 + 5*b^2*c^3 - 3*a*b^2*c^2 - 9*a^2*b^2*c))/(2*(2*a*c + a^2 - b^2 +
 c^2)) + (2*c*(b^5/2 + (b^4*(b^2 - 4*a*c)^(1/2))/2 + c^4*(b^2 - 4*a*c)^(1/2
) - b^3*c^2 + 2*a*c^3*(b^2 - 4*a*c)^(1/2) + 4*a^2*b*c^2 + a^2*c^2*(b^2 - 4*
a*c)^(1/2) - b^2*c^2*(b^2 - 4*a*c)^(1/2) + 4*a*b*c^3 - 3*a*b^3*c - 2*a*b^2*
c*(b^2 - 4*a*c)^(1/2))*(4*a*b^3 + 2*b*c^3 + 2*b^3*c + 3*b^4*cos(x) + 4*c^4*
cos(x) + 4*a*c^3*cos(x) - 4*a^3*c*cos(x) + a^2*b^2*cos(x) - 4*a^2*c^2*cos(x
) - 3*b^2*c^2*cos(x) - 12*a*b*c^2 - 14*a^2*b*c - 10*a*b^2*c*cos(x)))/((4*a*
c - b^2)*(2*a*c + a^2 - b^2 + c^2)^2) + (b*c*cos(x)*(36*a*c^3 + 4*a^3*c + 3
*b^4 + 16*c^4 - a^2*b^2 + 24*a^2*c^2 - 13*b^2*c^2 - 18*a*b^2*c))/(2*a*c + a
^2 - b^2 + c^2))*(b^5/2 + (b^4*(b^2 - 4*a*c)^(1/2))/2 + c^4*(b^2 - 4*a*c)^(
1/2) - b^3*c^2 + 2*a*c^3*(b^2 - 4*a*c)^(1/2) + 4*a^2*b*c^2 + a^2*c^2*(b^2 -
 4*a*c)^(1/2) - b^2*c^2*(b^2 - 4*a*c)^(1/2) + 4*a*b*c^3 - 3*a*b^3*c - 2*a*b
^2*c*(b^2 - 4*a*c)^(1/2)))/((4*a*c - b^2)*(2*a*c + a^2 - b^2 + c^2)^2) + (b
*c*(2*a*b^4 - 20*a*c^4 + 3*a^4*c - 6*b^4*c + 7*c^5 - a^3*b^2 - 26*a^2*c^3 +
 4*a^3*c^2 + 23*a*b^2*c^2 - 6*a^2*b^2*c))/(4*(2*a*c + a^2 - b^2 + c^2)^2) -
 (c*cos(x)*(64*a*c^5 + 26*c^6 + a^2*b^4 + 52*a^2*c^4 + 16*a^3*c^3 + 2*a^4*c
^2 - 18*b^2*c^4 + 9*b^4*c^2 - 32*a*b^2*c^3 - 4*a^3*b^2*c - 2*a^2*b^2*c^2 -
2*a*b^4*c))/(4*(2*a*c + a^2 - b^2 + c^2)^2))*(b^5/2 + (b^4*(b^2 - 4*a*c)^(1
```

```
/2))/2 + c^4*(b^2 - 4*a*c)^(1/2) - b^3*c^2 + 2*a*c^3*(b^2 - 4*a*c)^(1/2) +
4*a^2*b*c^2 + a^2*c^2*(b^2 - 4*a*c)^(1/2) - b^2*c^2*(b^2 - 4*a*c)^(1/2) + 4
*a*b*c^3 - 3*a*b^3*c - 2*a*b^2*c*(b^2 - 4*a*c)^(1/2)))/((4*a*c - b^2)*(2*a*
c + a^2 - b^2 + c^2)^2))*(b*(4*a*c^3 + 4*a^2*c^2) - b^3*(3*a*c + c^2) - b^2
*(c^2*(b^2 - 4*a*c)^(1/2) + 2*a*c*(b^2 - 4*a*c)^(1/2)) + b^5/2 + (b^4*(b^2
- 4*a*c)^(1/2))/2 + c^4*(b^2 - 4*a*c)^(1/2) + 2*a*c^3*(b^2 - 4*a*c)^(1/2) +
 a^2*c^2*(b^2 - 4*a*c)^(1/2)))/(4*a*c^5 + 4*a^5*c - b^6 + 2*a^2*b^4 - a^4*b
^2 + 16*a^2*c^4 + 24*a^3*c^3 + 16*a^4*c^2 - b^2*c^4 + 2*b^4*c^2 - 12*a*b^2*
c^3 - 12*a^3*b^2*c - 22*a^2*b^2*c^2 + 8*a*b^4*c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\csc^3(x)}{a + b\cos(x) + c\cos^2(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)**3/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Integral(csc(x)**3/(a + b*cos(x) + c*cos(x)**2), x)
```

3.6 $\int \frac{\sin^4(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=388

$$\frac{x\left(b^2-c(a+2c)\right)}{c^3}+\frac{2\left(b^2\left(b^2-2c(a+c)\right)-b\sqrt{b^2-4ac}\left(b^2-2c(a+c)\right)-2c\left(ab^2-c(a+c)^2\right)\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{\cdots}}}{\sqrt{-\sqrt{b^2-\cdots}}}\right.}{c^3\sqrt{b^2-4ac}\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}$$

```
[Out] 1/2*x/c+(b^2-c*(a+2*c))*x/c^3-b*sin(x)/c^2+1/2*cos(x)*sin(x)/c-2*arctan((b-
2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2))*
(b*(b^2-2*c*(a+c))+(-b^4-2*c^2*(a+c)^2+2*b^2*c*(2*a+c))/(-4*a*c+b^2)^(1/2))
/c^3/(b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)-2*ar
ctan((b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a*c+b^2)^(1/2))
^(1/2))*(b^4+2*c^2*(a+c)^2-2*b^2*c*(2*a+c)+b^3*(-4*a*c+b^2)^(1/2)-2*b*c*(a+
c)*(-4*a*c+b^2)^(1/2))/c^3/(-4*a*c+b^2)^(1/2)/(b-2*c+(-4*a*c+b^2)^(1/2))^(1
/2)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2)
```

Rubi [A] time = 11.01, antiderivative size = 386, normalized size of antiderivative = 0.99, number of steps used = 10, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {3267, 2637, 2635, 8, 3293, 2659, 205}

$$\frac{x\left(b^2-c(a+2c)\right)}{c^3}+\frac{2\left(-2b^2c(a+c)-b\sqrt{b^2-4ac}\left(b^2-2c(a+c)\right)-2c\left(ab^2-c(a+c)^2\right)+b^4\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{\cdots}}}{\sqrt{-\sqrt{b^2-\cdots}}}\right.}{c^3\sqrt{b^2-4ac}\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]^4/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] x/(2*c) + ((b^2 - c*(a + 2*c))*x)/c^3 + (2*(b^4 - 2*b^2*c*(a + c) - b*Sqrt[
b^2 - 4*a*c]*(b^2 - 2*c*(a + c)) - 2*c*(a*b^2 - c*(a + c)^2))*ArcTan[(Sqrt[
b - 2*c - Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/
(c^3*Sqrt[b^2 - 4*a*c]*Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c - Sqr
t[b^2 - 4*a*c]]) - (2*(b^4 + 2*c^2*(a + c)^2 - 2*b^2*c*(2*a + c) + b^3*Sqrt
[b^2 - 4*a*c] - 2*b*c*(a + c)*Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c + Sqr
t[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]])/(c^3*Sqrt[b^2
 - 4*a*c]*Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c
]]) - (b*Sin[x])/c^2 + (Cos[x]*Sin[x])/(2*c)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2635

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Sin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Sin[c
+ d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n
]
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3267

```
Int[((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b_.) + cos[(d_.) + (e_.)*(x_)]^
(n2_.)*(c_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandT
rig[(1 - cos[d + e*x]^2)^(m/2)*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n)
)^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && IntegerQ[m/2] &
& NeQ[b^2 - 4*a*c, 0] && IntegersQ[n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rubi steps

$$\int \frac{\sin^4(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(\frac{b^2-c(a+2c)}{c^3} - \frac{b\cos(x)}{c^2} + \frac{\cos^2(x)}{c} + \frac{-ab^2\left(1-\frac{c(a+c)^2}{ab^2}\right) - b^3\left(1-\frac{2c(a+c)}{b^2}\right) \cdots}{c^3\left(a+b\cos(x)+c\cos^2(x)\right)}\right.$$

$$= \frac{\left(b^2-c(a+2c)\right)x}{c^3} + \frac{\int \frac{-ab^2\left(1-\frac{c(a+c)^2}{ab^2}\right)-b^3\left(1-\frac{2c(a+c)}{b^2}\right)\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{c^3} - \frac{b\int\cos(x)\,dx}{c^2} + \cdots$$

$$= \frac{\left(b^2-c(a+2c)\right)x}{c^3} - \frac{b\sin(x)}{c^2} + \frac{\cos(x)\sin(x)}{2c} + \frac{\int 1\,dx}{2c} - \frac{\left(b^4+2c^2(a+c)^2-2\cdots\right.}{\cdots}$$

$$= \frac{x}{2c} + \frac{\left(b^2-c(a+2c)\right)x}{c^3} - \frac{b\sin(x)}{c^2} + \frac{\cos(x)\sin(x)}{2c} - \frac{\left(2\left(b^4+2c^2(a+c)^2-2b\cdots\right.\right.}{\cdots}$$

$$= \frac{x}{2c} + \frac{\left(b^2-c(a+2c)\right)x}{c^3} + \frac{2\left(b^4-2b^2c(a+c)-b\sqrt{b^2-4ac}\left(b^2-2c(a+c)\right)-\cdots\right.}{c^3\sqrt{b^2-4ac}\sqrt{b-2c-\sqrt{b^2-\cdots}}}$$

Mathematica [A] time = 0.89, size = 374, normalized size = 0.96

$$\frac{\frac{4\sqrt{2}\left(-2b^2c(2a+c)-2bc(a+c)\sqrt{b^2-4ac}+b^3\sqrt{b^2-4ac}+2c^2(a+c)^2+b^4\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}} - \frac{4\sqrt{2}\left(2b^2c(2a+c)-2bc(a+c)\sqrt{b^2-4ac}+b^3\cdots\right.}{\sqrt{b^2-4a\cdots}}\cdots}{4c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]^4/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (4*b^2*x - 2*c*(2*a + 3*c)*x + (4*Sqrt[2]*(b^4 + 2*c^2*(a + c)^2 - 2*b^2*c*
(2*a + c) + b^3*Sqrt[b^2 - 4*a*c] - 2*b*c*(a + c)*Sqrt[b^2 - 4*a*c])*ArcTan
h[((b - 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) - 2*b*
Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a + c) - b*Sqrt[b^
2 - 4*a*c]]) - (4*Sqrt[2]*(-b^4 - 2*c^2*(a + c)^2 + 2*b^2*c*(2*a + c) + b^3
*Sqrt[b^2 - 4*a*c] - 2*b*c*(a + c)*Sqrt[b^2 - 4*a*c])*ArcTanh[((-b + 2*c +
Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a
*c]]])/(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c]]) -
 4*b*c*Sin[x] + c^2*Sin[2*x])/(4*c^3)
```

fricas [B] time = 3.58, size = 5045, normalized size = 13.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^4/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(2)*c^3*sqrt(-(b^6 - 6*a*b^4*c - 6*a*c^5 - 2*c^6 - 3*(2*a^2 - b^2)
*c^4 - 2*(a^3 - 6*a*b^2)*c^3 + 3*(3*a^2*b^2 - b^4)*c^2 + (b^2*c^6 - 4*a*c^7
)*sqrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*
c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4
 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4
*a*c^13)))/(b^2*c^6 - 4*a*c^7))*log(24*a*b*c^6 + 6*b*c^7 + 12*(3*a^2*b - b^
3)*c^5 + 8*(3*a^3*b - 4*a*b^3)*c^4 + 2*(3*a^4*b - 14*a^2*b^3 + 4*b^5)*c^3 -
 4*(2*a^3*b^3 - 3*a*b^5)*c^2 - (4*a*c^9 + (8*a^2 - b^2)*c^8 + 2*(2*a^3 - 3*
a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9
*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a
^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2
*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13))*cos(x) + 2*(a^2*b^5 - b^7)*c + 1/
2*sqrt(2)*((b^4*c^7 - 6*a*b^2*c^8 + 8*a*c^10 + 2*(4*a^2 - b^2)*c^9)*sqrt((b
^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*
(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*
a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13))
*sin(x) - (b^8*c - 8*a*b^6*c^2 - 12*a*b^2*c^6 - 3*(8*a^2*b^2 - b^4)*c^5 - 6
*(2*a^3*b^2 - 3*a*b^4)*c^4 + (19*a^2*b^4 - 3*b^6)*c^3)*sin(x))*sqrt(-(b^6 -
 6*a*b^4*c - 6*a*c^5 - 2*c^6 - 3*(2*a^2 - b^2)*c^4 - 2*(a^3 - 6*a*b^2)*c^3
+ 3*(3*a^2*b^2 - b^4)*c^2 + (b^2*c^6 - 4*a*c^7)*sqrt((b^10 - 8*a*b^8*c + 36
*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4
)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c
^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13)))/(b^2*c^6 - 4*a*c^7
)) + (a^2*b^6 - b^8 + 12*a*b^2*c^5 + 3*b^2*c^6 + 6*(3*a^2*b^2 - b^4)*c^4 +
4*(3*a^3*b^2 - 4*a*b^4)*c^3 + (3*a^4*b^2 - 14*a^2*b^4 + 4*b^6)*c^2 - 2*(2*a
^3*b^4 - 3*a*b^6)*c)*cos(x)) - sqrt(2)*c^3*sqrt(-(b^6 - 6*a*b^4*c - 6*a*c^5
 - 2*c^6 - 3*(2*a^2 - b^2)*c^4 - 2*(a^3 - 6*a*b^2)*c^3 + 3*(3*a^2*b^2 - b^4
)*c^2 + (b^2*c^6 - 4*a*c^7)*sqrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c
^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2
 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 -
 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13)))/(b^2*c^6 - 4*a*c^7))*log(24*a*b*c^6 +
6*b*c^7 + 12*(3*a^2*b - b^3)*c^5 + 8*(3*a^3*b - 4*a*b^3)*c^4 + 2*(3*a^4*b -
 14*a^2*b^3 + 4*b^5)*c^3 - 4*(2*a^3*b^3 - 3*a*b^5)*c^2 - (4*a*c^9 + (8*a^2
- b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt((b^10 - 8*
a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b
^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4
- 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13))*cos(x)
```

```
+ 2*(a^2*b^5 - b^7)*c - 1/2*sqrt(2)*((b^4*c^7 - 6*a*b^2*c^8 + 8*a*c^10 + 2*
(4*a^2 - b^2)*c^9)*sqrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(
3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2
*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c
^2)/(b^2*c^12 - 4*a*c^13))*sin(x) - (b^8*c - 8*a*b^6*c^2 - 12*a*b^2*c^6 - 3
*(8*a^2*b^2 - b^4)*c^5 - 6*(2*a^3*b^2 - 3*a*b^4)*c^4 + (19*a^2*b^4 - 3*b^6)
*c^3)*sin(x))*sqrt(-(b^6 - 6*a*b^4*c - 6*a*c^5 - 2*c^6 - 3*(2*a^2 - b^2)*c^
4 - 2*(a^3 - 6*a*b^2)*c^3 + 3*(3*a^2*b^2 - b^4)*c^2 + (b^2*c^6 - 4*a*c^7)*s
qrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6
 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 -
12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*
c^13)))/(b^2*c^6 - 4*a*c^7)) + (a^2*b^6 - b^8 + 12*a*b^2*c^5 + 3*b^2*c^6 +
6*(3*a^2*b^2 - b^4)*c^4 + 4*(3*a^3*b^2 - 4*a*b^4)*c^3 + (3*a^4*b^2 - 14*a^2
*b^4 + 4*b^6)*c^2 - 2*(2*a^3*b^4 - 3*a*b^6)*c)*cos(x)) + sqrt(2)*c^3*sqrt(-
(b^6 - 6*a*b^4*c - 6*a*c^5 - 2*c^6 - 3*(2*a^2 - b^2)*c^4 - 2*(a^3 - 6*a*b^2
)*c^3 + 3*(3*a^2*b^2 - b^4)*c^2 - (b^2*c^6 - 4*a*c^7)*sqrt((b^10 - 8*a*b^8*
c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5
*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*
b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13)))/(b^2*c^6 - 4
*a*c^7))*log(-24*a*b*c^6 - 6*b*c^7 - 12*(3*a^2*b - b^3)*c^5 - 8*(3*a^3*b -
4*a*b^3)*c^4 - 2*(3*a^4*b - 14*a^2*b^3 + 4*b^5)*c^3 + 4*(2*a^3*b^3 - 3*a*b^
5)*c^2 - (4*a*c^9 + (8*a^2 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2
- b^4)*c^6)*sqrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b
^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 +
5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^
2*c^12 - 4*a*c^13))*cos(x) - 2*(a^2*b^5 - b^7)*c + 1/2*sqrt(2)*((b^4*c^7 -
6*a*b^2*c^8 + 8*a*c^10 + 2*(4*a^2 - b^2)*c^9)*sqrt((b^10 - 8*a*b^8*c + 36*a
*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*
c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3
 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13))*sin(x) + (b^8*c - 8*a
*b^6*c^2 - 12*a*b^2*c^6 - 3*(8*a^2*b^2 - b^4)*c^5 - 6*(2*a^3*b^2 - 3*a*b^4)
*c^4 + (19*a^2*b^4 - 3*b^6)*c^3)*sin(x))*sqrt(-(b^6 - 6*a*b^4*c - 6*a*c^5 -
 2*c^6 - 3*(2*a^2 - b^2)*c^4 - 2*(a^3 - 6*a*b^2)*c^3 + 3*(3*a^2*b^2 - b^4)*
c^2 - (b^2*c^6 - 4*a*c^7)*sqrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8
 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 -
 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3
*b^8)*c^2)/(b^2*c^12 - 4*a*c^13)))/(b^2*c^6 - 4*a*c^7)) - (a^2*b^6 - b^8 +
12*a*b^2*c^5 + 3*b^2*c^6 + 6*(3*a^2*b^2 - b^4)*c^4 + 4*(3*a^3*b^2 - 4*a*b^4
)*c^3 + (3*a^4*b^2 - 14*a^2*b^4 + 4*b^6)*c^2 - 2*(2*a^3*b^4 - 3*a*b^6)*c)*c
os(x)) - sqrt(2)*c^3*sqrt(-(b^6 - 6*a*b^4*c - 6*a*c^5 - 2*c^6 - 3*(2*a^2 -
b^2)*c^4 - 2*(a^3 - 6*a*b^2)*c^3 + 3*(3*a^2*b^2 - b^4)*c^2 - (b^2*c^6 - 4*a
*c^7)*sqrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b
^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)
*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12
 - 4*a*c^13)))/(b^2*c^6 - 4*a*c^7))*log(-24*a*b*c^6 - 6*b*c^7 - 12*(3*a^2*b
```

```
 - b^3)*c^5 - 8*(3*a^3*b - 4*a*b^3)*c^4 - 2*(3*a^4*b - 14*a^2*b^3 + 4*b^5)*
c^3 + 4*(2*a^3*b^3 - 3*a*b^5)*c^2 - (4*a*c^9 + (8*a^2 - b^2)*c^8 + 2*(2*a^3
 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt((b^10 - 8*a*b^8*c + 36*a*b^2*c^
7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3
*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(1
1*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13))*cos(x) - 2*(a^2*b^5 - b^7)*c
 - 1/2*sqrt(2)*((b^4*c^7 - 6*a*b^2*c^8 + 8*a*c^10 + 2*(4*a^2 - b^2)*c^9)*sq
rt((b^10 - 8*a*b^8*c + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6
+ 12*(3*a^3*b^2 - 5*a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 1
2*(2*a^3*b^4 - 3*a*b^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c
^13))*sin(x) + (b^8*c - 8*a*b^6*c^2 - 12*a*b^2*c^6 - 3*(8*a^2*b^2 - b^4)*c^
5 - 6*(2*a^3*b^2 - 3*a*b^4)*c^4 + (19*a^2*b^4 - 3*b^6)*c^3)*sin(x))*sqrt(-(
b^6 - 6*a*b^4*c - 6*a*c^5 - 2*c^6 - 3*(2*a^2 - b^2)*c^4 - 2*(a^3 - 6*a*b^2)
*c^3 + 3*(3*a^2*b^2 - b^4)*c^2 - (b^2*c^6 - 4*a*c^7)*sqrt((b^10 - 8*a*b^8*c
 + 36*a*b^2*c^7 + 9*b^2*c^8 + 18*(3*a^2*b^2 - b^4)*c^6 + 12*(3*a^3*b^2 - 5*
a*b^4)*c^5 + 3*(3*a^4*b^2 - 22*a^2*b^4 + 5*b^6)*c^4 - 12*(2*a^3*b^4 - 3*a*b
^6)*c^3 + 2*(11*a^2*b^6 - 3*b^8)*c^2)/(b^2*c^12 - 4*a*c^13)))/(b^2*c^6 - 4*
a*c^7)) - (a^2*b^6 - b^8 + 12*a*b^2*c^5 + 3*b^2*c^6 + 6*(3*a^2*b^2 - b^4)*c
^4 + 4*(3*a^3*b^2 - 4*a*b^4)*c^3 + (3*a^4*b^2 - 14*a^2*b^4 + 4*b^6)*c^2 - 2
*(2*a^3*b^4 - 3*a*b^6)*c)*cos(x)) + 2*(2*b^2 - 2*a*c - 3*c^2)*x + 2*(c^2*co
s(x) - 2*b*c)*sin(x))/c^3
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^4/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.15, size = 2608, normalized size = 6.72

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)^4/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 1/c^3*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan(
(a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3-2/c^2*a/((
(-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b+2/c/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(
1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a
+c)*(a-b+c))^(1/2))*a^2+1/c^3/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arct
```

```
an((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3+1/c^2/(
((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a
*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2+2/c*a/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b
+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(
1/2))+1/c^2/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2
*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2+2/c*a/(((-4*a*c+b^2)^(1/2
)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(
a-b+c))^(1/2))-2/c*b/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b
-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))-2/c*b/(((-4*a*c+b^
2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)
+a-c)*(a-b+c))^(1/2))+b/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c
))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)
)+4*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((
-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))-b/(-4*a*c+b^2)
^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)
/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))-4*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c
+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1
/2)+a-c)*(a-b+c))^(1/2))-2/c^2/(tan(1/2*x)^2+1)^2*tan(1/2*x)^3*b-2/c^2/(tan
(1/2*x)^2+1)^2*tan(1/2*x)*b+2*c/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c
)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b
+c))^(1/2))-2*c/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)
*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))+1/c^3/
(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*
a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^3-1/c^3*a/(((-4*a*c+b^2)^(1/2)-a+c)*(
a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c)
)^(1/2))*b^2+1/c^3/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1
/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b
^4-1/c^3/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan
((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^4-3/c^2/(-4
*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan
(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2*b+4/c^2*a/(-4*a*c+b^2
)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/
(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2-4/c^2*a/(-4*a*c+b^2)^(1/2)/((
(-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^2-2/c*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^
2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)
+a-c)*(a-b+c))^(1/2))*b+3/c^2/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*
(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c
))^(1/2))*a^2*b+2/c*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))
^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)
)*b-1/c^3*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arc
tanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^3-3/c*
arctan(tan(1/2*x))+1/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b
-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))+1/(((-4*a*c+b^2)^(
1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c
```

```
)*(a-b+c))^(1/2))+2/c/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))
^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*
b^2-2/c^2*a/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2
*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b-2/c/(-4*a*c+b^2)^(1/2)/(((-
4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^
2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2-1/c/(tan(1/2*x)^2+1)^2*tan(1/2*x)^3+1/c/(
tan(1/2*x)^2+1)^2*tan(1/2*x)-2/c^2*arctan(tan(1/2*x))*a+2/c^3*arctan(tan(1/
2*x))*b^2-2/c/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*a
rctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^2-1/
c^3*a/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/((
(-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^4/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] 1/4*(4*c^3*integrate(-2*(2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*cos(3*x)^2 + 4*(2*
a^2*b^2 - 5*a^2*c^2 - 4*a*c^3 - c^4 - (2*a^3 - a*b^2)*c)*cos(2*x)^2 + 2*(b^
4 - 2*a*b^2*c - 2*b^2*c^2)*cos(x)^2 + 2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*sin(3
*x)^2 + 4*(2*a^2*b^2 - 5*a^2*c^2 - 4*a*c^3 - c^4 - (2*a^3 - a*b^2)*c)*sin(2
*x)^2 + 2*(4*a*b^3 - 10*a*b*c^2 - 4*b*c^3 - (6*a^2*b - b^3)*c)*sin(2*x)*sin
(x) + 2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*sin(x)^2 + ((b^3*c - 2*a*b*c^2 - 2*b*
c^3)*cos(3*x) + 2*(a*b^2*c - a^2*c^2 - 2*a*c^3 - c^4)*cos(2*x) + (b^3*c - 2
*a*b*c^2 - 2*b*c^3)*cos(x))*cos(4*x) + (b^3*c - 2*a*b*c^2 - 2*b*c^3 + 2*(4*
a*b^3 - 10*a*b*c^2 - 4*b*c^3 - (6*a^2*b - b^3)*c)*cos(2*x) + 4*(b^4 - 2*a*b
^2*c - 2*b^2*c^2)*cos(x))*cos(3*x) + 2*(a*b^2*c - a^2*c^2 - 2*a*c^3 - c^4 +
 (4*a*b^3 - 10*a*b*c^2 - 4*b*c^3 - (6*a^2*b - b^3)*c)*cos(x))*cos(2*x) + (b
^3*c - 2*a*b*c^2 - 2*b*c^3)*cos(x) + ((b^3*c - 2*a*b*c^2 - 2*b*c^3)*sin(3*x
) + 2*(a*b^2*c - a^2*c^2 - 2*a*c^3 - c^4)*sin(2*x) + (b^3*c - 2*a*b*c^2 - 2
*b*c^3)*sin(x))*sin(4*x) + 2*((4*a*b^3 - 10*a*b*c^2 - 4*b*c^3 - (6*a^2*b -
b^3)*c)*sin(2*x) + 2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*sin(x))*sin(3*x))/(c^5*c
os(4*x)^2 + 4*b^2*c^3*cos(3*x)^2 + 4*b^2*c^3*cos(x)^2 + c^5*sin(4*x)^2 + 4*
b^2*c^3*sin(3*x)^2 + 4*b^2*c^3*sin(x)^2 + 4*b*c^4*cos(x) + c^5 + 4*(4*a^2*c
^3 + 4*a*c^4 + c^5)*cos(2*x)^2 + 4*(4*a^2*c^3 + 4*a*c^4 + c^5)*sin(2*x)^2 +
 8*(2*a*b*c^3 + b*c^4)*sin(2*x)*sin(x) + 2*(2*b*c^4*cos(3*x) + 2*b*c^4*cos(
x) + c^5 + 2*(2*a*c^4 + c^5)*cos(2*x))*cos(4*x) + 4*(2*b^2*c^3*cos(x) + b*c
^4 + 2*(2*a*b*c^3 + b*c^4)*cos(2*x))*cos(3*x) + 4*(2*a*c^4 + c^5 + 2*(2*a*b
*c^3 + b*c^4)*cos(x))*cos(2*x) + 4*(b*c^4*sin(3*x) + b*c^4*sin(x) + (2*a*c^
4 + c^5)*sin(2*x))*sin(4*x) + 8*(b^2*c^3*sin(x) + (2*a*b*c^3 + b*c^4)*sin(2
*x))*sin(3*x)), x) + c^2*sin(2*x) - 4*b*c*sin(x) + 2*(2*b^2 - 2*a*c - 3*c^2
)*x)/c^3
```

mupad [B] time = 13.77, size = 46613, normalized size = 120.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)^4/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] atan(((((((2048*(48*a*c^15 + 272*a^2*c^14 + 576*a^3*c^13 + 576*a^4*c^12 + 2
72*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^14 + 20*b^3*c^13 + 18*b^4*c^12 - 46*b^
5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2*c^13 + 288*a*b^3*
c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a
^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*b*c^11 - 144*a^5*b*c^10 - 360*a^2*b^2*
c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8
 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 -
172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*
b*c^14))/c^8 - (2048*tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 +
8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^
2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2
*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(
1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a
*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b
^4*c^6 - 8*a*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*
a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^
12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4
*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32
*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b
^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*
c^11 - 96*a*b*c^15))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^
4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 -
18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2
*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2)
 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c -
 b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c
^6 - 8*a*b^2*c^7)))^(1/2) + (2048*tan(x/2)*(24*b*c^14 - 96*a*c^14 - 8*c^15
+ 152*a^2*c^13 + 952*a^3*c^12 + 1096*a^4*c^11 + 304*a^5*c^10 - 152*a^6*c^9
- 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*c^12 - 7*b^4*c^11 + 39*b^5*c^10 - 15*b^6
*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^10*c^5 - 8*b^11*c^4 + 68*
a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*b^4*c^10 - 400*a*b^5*c^9 + 537*a*b^6*c^8
 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^10*c^4 - 944*a^2*b*c
^12 - 2520*a^3*b*c^11 - 1824*a^4*b*c^10 - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 58
4*a^2*b^2*c^11 + 1742*a^2*b^3*c^10 - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1
132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a
^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a
^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3
```

```
*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8
 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8
)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b
^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*
c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 -
38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*
c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3
*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2
) + (2048*(236*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11
 + 2784*a^4*c^10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 -
39*b^2*c^12 + 121*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*b
^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2
 - 635*a*b^2*c^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a
*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 +
 20*a*b^11*c^2 - 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*
a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3
*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*
c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9
 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5
+ 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 502
5*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156
*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^
5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^
3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8)*(-(8*a*c^7
+ b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2)
- 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4
*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^
3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c
- b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c -
 b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) - (2048*tan
(x/2)*(20*a*b^12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40
*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c
^10 - 1538*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 +
 12*a^9*c^4 + 14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6
*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 -
 518*a*b^2*c^10 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^
6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^2 + 15
50*a^2*b*c^10 - 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*
b*c^8 - 300*a^4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24
*a^6*b^6*c - 440*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3
*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7
*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*
c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7
*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630*a^4*b^3*c^6 - 2295*a^4*b^4
*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*c^2 + 3314*a^5*b^2
```

*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*c^3 + 732*a^5*b^6*
c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a^6*b^4*c^3 - 300*a^6*b^5*c^
2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 1
48*a*b*c^11 + 24*a*b^11*c))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5
 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6
*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*
a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3
)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(
4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8
+ b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*1i - (((((2048*(48*a*c^15 + 272*a^2*c^14 +
 576*a^3*c^13 + 576*a^4*c^12 + 272*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^14 + 2
0*b^3*c^13 + 18*b^4*c^12 - 46*b^5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c
^8 - 140*a*b^2*c^13 + 288*a*b^3*c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10 + 74*
a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*b*c^11
 - 144*a^5*b*c^10 - 360*a^2*b^2*c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*c^10 -
 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^10 + 10
*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*
b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^14))/c^8 + (2048*tan(x/2)*(-(8*a*c^7 +
b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) -
2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(
-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3
- 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c -
b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b
^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*(32*a*c^16 -
64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^
3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c
^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*
a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*
c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^1
1 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^8)*(-(8*a*c^7 + b^8
+ 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^
2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*
a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*
b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)
^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^
3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) - (2048*tan(x/2)*
(24*b*c^14 - 96*a*c^14 - 8*c^15 + 152*a^2*c^13 + 952*a^3*c^12 + 1096*a^4*c^
11 + 304*a^5*c^10 - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*c^12 - 7
*b^4*c^11 + 39*b^5*c^10 - 15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6
+ 24*b^10*c^5 - 8*b^11*c^4 + 68*a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*b^4*c^10
 - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*
c^5 + 8*a*b^10*c^4 - 944*a^2*b*c^12 - 2520*a^3*b*c^11 - 1824*a^4*b*c^10 - 2
72*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^11 + 1742*a^2*b^3*c^10 - 1645*a
^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2
*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 1705*a^3*b

^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*(236*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11 + 2784*a^4*c^10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^12 + 121*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 635*a*b^2*c^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 - 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*tan(x/2)*(20*a*b^12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 1538*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b^2*c^10 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b*c^10 - 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*b*c^8 - 300*a^4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24*a^6*b^6*c - 440*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2*c^7 -

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5630*a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^6*c^3
- 740*a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^4*c^4
+ 308*a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*c^4 -
696*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*
a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b*c^11 + 24*a*b^11*c))/c^8)*(-(8*a*c^7
 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2)
 - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^
4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c
^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c
 - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c
- b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*1i)/((4096
*(16*a*b^11 + 274*a*c^11 - 78*b*c^11 + 4*b^11*c - 4*b^12 + 33*c^12 - 16*a^2
*b^10 - 16*a^3*b^9 + 40*a^4*b^8 - 16*a^5*b^7 - 16*a^6*b^6 + 16*a^7*b^5 - 4*
a^8*b^4 + 1008*a^2*c^10 + 2156*a^3*c^9 + 2954*a^4*c^8 + 2688*a^5*c^7 + 1624
*a^6*c^6 + 628*a^7*c^5 + 141*a^8*c^4 + 14*a^9*c^3 - 64*b^2*c^10 + 268*b^3*c
^9 - 26*b^4*c^8 - 348*b^5*c^7 + 144*b^6*c^6 + 208*b^7*c^5 - 123*b^8*c^4 - 5
4*b^9*c^3 + 40*b^10*c^2 - 520*a*b^2*c^9 + 1516*a*b^3*c^8 + 144*a*b^4*c^7 -
1564*a*b^5*c^6 + 228*a*b^6*c^5 + 740*a*b^7*c^4 - 146*a*b^8*c^3 - 164*a*b^9*
c^2 - 1624*a^2*b*c^9 - 112*a^2*b^9*c - 2676*a^3*b*c^8 + 128*a^3*b^8*c - 258
8*a^4*b*c^7 + 56*a^4*b^7*c - 1388*a^5*b*c^6 - 184*a^5*b^6*c - 264*a^6*b*c^5
 + 80*a^6*b^5*c + 116*a^7*b*c^4 + 32*a^7*b^4*c + 74*a^8*b*c^3 - 28*a^8*b^3*
c + 12*a^9*b*c^2 + 4*a^9*b^2*c - 1820*a^2*b^2*c^8 + 3576*a^2*b^3*c^7 + 1032
*a^2*b^4*c^6 - 2792*a^2*b^5*c^5 - 236*a^2*b^6*c^4 + 920*a^2*b^7*c^3 + 64*a^
2*b^8*c^2 - 3584*a^3*b^2*c^7 + 4472*a^3*b^3*c^6 + 2236*a^3*b^4*c^5 - 2436*a
^3*b^5*c^4 - 744*a^3*b^6*c^3 + 464*a^3*b^7*c^2 - 4336*a^4*b^2*c^6 + 3040*a^
4*b^3*c^5 + 2390*a^4*b^4*c^4 - 964*a^4*b^5*c^3 - 592*a^4*b^6*c^2 - 3284*a^5
*b^2*c^5 + 908*a^5*b^3*c^4 + 1364*a^5*b^4*c^3 - 40*a^5*b^5*c^2 - 1500*a^6*b
^2*c^4 - 104*a^6*b^3*c^3 + 384*a^6*b^4*c^2 - 360*a^7*b^2*c^3 - 144*a^7*b^3*
c^2 - 24*a^8*b^2*c^2 - 544*a*b*c^10 + 20*a*b^10*c))/c^8 + (((((2048*(48*a*c
^15 + 272*a^2*c^14 + 576*a^3*c^13 + 576*a^4*c^12 + 272*a^5*c^11 + 48*a^6*c^
10 - 12*b^2*c^14 + 20*b^3*c^13 + 18*b^4*c^12 - 46*b^5*c^11 + 6*b^6*c^10 + 2
6*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2*c^13 + 288*a*b^3*c^12 + 30*a*b^4*c^11 -
240*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2*b*c^13 - 736*a^3*b*c
^12 - 544*a^4*b*c^11 - 144*a^5*b*c^10 - 360*a^2*b^2*c^12 + 728*a^2*b^3*c^11
 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2*c^11 + 5
44*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 172*a^4*b^2*c^10 + 116*
a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^14))/c^8 - (2048*ta
n(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*
c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a
*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c
^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a
^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*
a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))
^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12
- 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^
```

7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 -
8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b
^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c
^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^
8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c -
b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4
*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 -
38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b
c^2(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^
3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/
2) + (2048*tan(x/2)*(24*b*c^14 - 96*a*c^14 - 8*c^15 + 152*a^2*c^13 + 952*a^
3*c^12 + 1096*a^4*c^11 + 304*a^5*c^10 - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^
13 - 38*b^3*c^12 - 7*b^4*c^11 + 39*b^5*c^10 - 15*b^6*c^9 + 35*b^7*c^8 - 44*
b^8*c^7 - 4*b^9*c^6 + 24*b^10*c^5 - 8*b^11*c^4 + 68*a*b^2*c^12 + 42*a*b^3*c
^11 - 159*a*b^4*c^10 - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a
*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^10*c^4 - 944*a^2*b*c^12 - 2520*a^3*b*c^11 -
1824*a^4*b*c^10 - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^11 + 1742*a
^2*b^3*c^10 - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a
^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^10 + 2766*a^3*
b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7
*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7
+ 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 22
0*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8)*(-(8*a*c^7 + b^8 + 24
*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^
6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c
- b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*
c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^
(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*(236*a*c^13 -
32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11 + 2784*a^4*c^10 + 1948
*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^12 + 121*b^3*c
^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^8*c^6 - 1
27*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 635*a*b^2*c^11 + 130
0*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 1218*a*b^7*c
^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 - 1616*a
^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 704*a^6*b*c
^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3*c^9 + 1420*a^2*b^4*c^8
- 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*b^8*c^4 -
222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^3*c^8 + 1
730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c^4 + 2*a
^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 + 1339*a^
4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^
8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^5 - 388*a^5*b^5
*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4
- 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24

```
*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4
 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/
2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b
*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*
a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(20*a*b^12 + 42*a
*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^11 + 40*a^3*b^10
 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 1538*a^4*c^9 - 12
78*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^
11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 10
5*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b^2*c^10 - 264*a
*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 +
 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b*c^10 - 160*a^2
*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*b*c^8 - 300*a^4*b^8*c +
 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24*a^6*b^6*c - 440*a^7*b*
c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7
 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3
 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6
+ 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2
+ 2350*a^4*b^2*c^7 - 5630*a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4
 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5
 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5
+ 576*a^6*b^3*c^4 - 696*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 2
72*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b*c^11 + 24*a*b^11
*c))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4
*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 2
4*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^
4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c +
3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) -
 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7
)))^(1/2) + (((((2048*(48*a*c^15 + 272*a^2*c^14 + 576*a^3*c^13 + 576*a^4*c^
12 + 272*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^14 + 20*b^3*c^13 + 18*b^4*c^12 -
 46*b^5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2*c^13 + 288*
a*b^3*c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 -
 416*a^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*b*c^11 - 144*a^5*b*c^10 - 360*a^
2*b^2*c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b
^6*c^8 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*
c^8 - 172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 -
 80*a*b*c^14))/c^8 + (2048*tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*
c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*
b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) -
54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2
)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*
(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c
^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14
```

+ 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*
b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184
*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^1
3 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8
*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^
4*b^2*c^11 - 96*a*b*c^15))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5
+ 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*
c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a
^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)
^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4
*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 +
b^4*c^6 - 8*a*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(24*b*c^14 - 96*a*c^14 - 8
*c^15 + 152*a^2*c^13 + 952*a^3*c^12 + 1096*a^4*c^11 + 304*a^5*c^10 - 152*a^
6*c^9 - 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*c^12 - 7*b^4*c^11 + 39*b^5*c^10 -
15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^10*c^5 - 8*b^11*c^4
+ 68*a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*b^4*c^10 - 400*a*b^5*c^9 + 537*a*b
^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^10*c^4 - 944*a
^2*b*c^12 - 2520*a^3*b*c^11 - 1824*a^4*b*c^10 - 272*a^5*b*c^9 + 88*a^6*b*c^
8 + 584*a^2*b^2*c^11 + 1742*a^2*b^3*c^10 - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c
^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 +
476*a^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 +
456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a
^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b
^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^13
))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a
*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*
a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*
c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*
a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4
*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7))
)^(1/2) + (2048*(236*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^
3*c^11 + 2784*a^4*c^10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*
c^6 - 39*b^2*c^12 + 121*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 +
232*b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^
12*c^2 - 635*a*b^2*c^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8
- 60*a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10
*c^3 + 20*a*b^11*c^2 - 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 -
2132*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a
^2*b^3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^
2*b^7*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b
^2*c^9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^
6*c^5 + 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8
+ 5025*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4
+ 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 +
634*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*

a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8)*(-(8*
a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^
(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3
*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*
b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(
4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4
*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (20
48*tan(x/2)*(20*a*b^12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^1
3 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938
*a^3*c^10 - 1538*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8
*c^5 + 12*a^9*c^4 + 14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 1
60*b^6*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11
*c^2 - 518*a*b^2*c^10 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 131
2*a*b^6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^
2 + 1550*a^2*b*c^10 - 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 335
0*a^4*b*c^8 - 300*a^4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^
6 - 24*a^6*b^6*c - 440*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a
^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a
^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^
3*b^3*c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a
^3*b^7*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630*a^4*b^3*c^6 - 2295*a
^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*c^2 + 3314*a
^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*c^3 + 732*a^
5*b^6*c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a^6*b^4*c^3 - 300*a^6*
b^5*c^2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c
^3 + 148*a*b*c^11 + 24*a*b^11*c))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a
^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 -
3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2)
- 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c -
b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c
^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^
2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24
*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4
- 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/
2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b
c^3(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*
a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*2i - ((tan(x/2)*(2*b - c))/c^2 + (
tan(x/2)^3*(2*b + c))/c^2)/(2*tan(x/2)^2 + tan(x/2)^4 + 1) + atan((((((((204
8*(48*a*c^15 + 272*a^2*c^14 + 576*a^3*c^13 + 576*a^4*c^12 + 272*a^5*c^11 +
48*a^6*c^10 - 12*b^2*c^14 + 20*b^3*c^13 + 18*b^4*c^12 - 46*b^5*c^11 + 6*b^6
*c^10 + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2*c^13 + 288*a*b^3*c^12 + 30*a*b^
4*c^11 - 240*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2*b*c^13 - 73
6*a^3*b*c^12 - 544*a^4*b*c^11 - 144*a^5*b*c^10 - 360*a^2*b^2*c^12 + 728*a^2
*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2

```
*c^11 + 544*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 172*a^4*b^2*c^
10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^14))/c^8 -
 (2048*tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^
5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c
^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*
a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^
6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(
1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b
^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*
a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^
11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b
^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 -
320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*
a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*
c^15))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-
(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 +
 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*
b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c
- 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2)
 + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c
^7)))^(1/2) + (2048*tan(x/2)*(24*b*c^14 - 96*a*c^14 - 8*c^15 + 152*a^2*c^13
 + 952*a^3*c^12 + 1096*a^4*c^11 + 304*a^5*c^10 - 152*a^6*c^9 - 72*a^7*c^8 +
 2*b^2*c^13 - 38*b^3*c^12 - 7*b^4*c^11 + 39*b^5*c^10 - 15*b^6*c^9 + 35*b^7*
c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^10*c^5 - 8*b^11*c^4 + 68*a*b^2*c^12 + 4
2*a*b^3*c^11 - 159*a*b^4*c^10 - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^
7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^10*c^4 - 944*a^2*b*c^12 - 2520*a^3
*b*c^11 - 1824*a^4*b*c^10 - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^11
 + 1742*a^2*b^3*c^10 - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^
7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^10 +
2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 5
6*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4
*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3
*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8)*(-(8*a*c^7 +
 b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) -
 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*
(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3
 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c -
 b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c -
b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*(236
*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11 + 2784*a^4*c^
10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^12 +
121*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^
8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 635*a*b^2*c
^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 121
8*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2
```

- 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 70
4*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3*c^9 + 1420*a^
2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*
b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^
3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*
c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7
+ 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7*c^3 +
8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^5 - 38
8*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^
6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2
*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 +
3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^
2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*
(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2
) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2)
)/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(20*a*b^
12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^11 + 40
*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 1538*a^4
*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4 +
14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*b^7
*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b^2*c^1
0 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268*a*
b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b*c^10
- 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*b*c^8 - 300*a^
4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24*a^6*b^6*c - 4
40*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564*a^
2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048*a^
2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*a^3
*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*a^3
*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630*a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563*a^
4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456*a^
5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*a^6
*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7*b^
2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b*c^11 +
24*a*b^11*c))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 -
b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^
2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 +
33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a
*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3
)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*
a*b^2*c^7)))^(1/2)*1i - (((((2048*(48*a*c^15 + 272*a^2*c^14 + 576*a^3*c^13
+ 576*a^4*c^12 + 272*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^14 + 20*b^3*c^13 + 1
8*b^4*c^12 - 46*b^5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2
*c^13 + 288*a*b^3*c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10 + 74*a*b^6*c^9 + 20
*a*b^7*c^8 - 416*a^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*b*c^11 - 144*a^5*b*c

^10 - 360*a^2*b^2*c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c
^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^10 + 10*a^3*b^4*c^9 -
20*a^3*b^5*c^8 - 172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a
^5*b^2*c^9 - 80*a*b*c^14))/c^8 + (2048*tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c
^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*
b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)
^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-
(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2)
- 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/
(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 -
128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^
4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^
3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 3
52*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*
b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*
c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 +
24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*
c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^
(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a
*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*
a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(
16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(24*b*c^14 - 9
6*a*c^14 - 8*c^15 + 152*a^2*c^13 + 952*a^3*c^12 + 1096*a^4*c^11 + 304*a^5*c
^10 - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*c^12 - 7*b^4*c^11 + 39
*b^5*c^10 - 15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^10*c^5
- 8*b^11*c^4 + 68*a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*b^4*c^10 - 400*a*b^5*c
^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^10
*c^4 - 944*a^2*b*c^12 - 2520*a^3*b*c^11 - 1824*a^4*b*c^10 - 272*a^5*b*c^9 +
88*a^6*b*c^8 + 584*a^2*b^2*c^11 + 1742*a^2*b^3*c^10 - 1645*a^2*b^4*c^9 - 7
95*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a
^2*b^9*c^4 + 476*a^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a
^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2
*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5
+ 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 +
136*a*b*c^13))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4
- b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b
^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 +
33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*
a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^
3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8
*a*b^2*c^7)))^(1/2) + (2048*(236*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^
12 + 2328*a^3*c^11 + 2784*a^4*c^10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c
^7 + 12*a^8*c^6 - 39*b^2*c^12 + 121*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 -
36*b^6*c^8 + 232*b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11
*c^3 - 12*b^12*c^2 - 635*a*b^2*c^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 179

```
2*a*b^5*c^8 - 60*a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4
 + 98*a*b^10*c^3 + 20*a*b^11*c^2 - 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440
*a^4*b*c^9 - 2132*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c
^10 + 4146*a^2*b^3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c
^6 + 1735*a^2*b^7*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2
- 3714*a^3*b^2*c^9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6
 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523
*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192
*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^
5*b^3*c^6 + 634*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^
2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12)
)/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*
c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a
*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c
^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a
^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*
a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))
^(1/2) + (2048*tan(x/2)*(20*a*b^12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b
^13 + 22*c^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^
2*c^11 - 938*a^3*c^10 - 1538*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*
c^6 + 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39
*b^5*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c
^3 + 28*b^11*c^2 - 518*a*b^2*c^10 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b
^5*c^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 1
80*a*b^10*c^2 + 1550*a^2*b*c^10 - 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3
*b^9*c + 3350*a^4*b*c^8 - 300*a^4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c -
462*a^6*b*c^6 - 24*a^6*b^6*c - 440*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*
c^9 - 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6
*c^5 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c
^8 - 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*
c^4 - 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630*a^4*b^3*
c^6 - 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*
c^2 + 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*
c^3 + 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a^6*b^4*c^
3 - 300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 -
32*a^8*b^2*c^3 + 148*a*b*c^11 + 24*a*b^11*c))/c^8)*(-(8*a*c^7 + b^8 + 24*a^
2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 +
 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b
^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2
*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/
2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2
))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*1i)/((4096*(16*a*b^11 +
274*a*c^11 - 78*b*c^11 + 4*b^11*c - 4*b^12 + 33*c^12 - 16*a^2*b^10 - 16*a^3
*b^9 + 40*a^4*b^8 - 16*a^5*b^7 - 16*a^6*b^6 + 16*a^7*b^5 - 4*a^8*b^4 + 1008
*a^2*c^10 + 2156*a^3*c^9 + 2954*a^4*c^8 + 2688*a^5*c^7 + 1624*a^6*c^6 + 628
```

*a^7*c^5 + 141*a^8*c^4 + 14*a^9*c^3 - 64*b^2*c^10 + 268*b^3*c^9 - 26*b^4*c^
8 - 348*b^5*c^7 + 144*b^6*c^6 + 208*b^7*c^5 - 123*b^8*c^4 - 54*b^9*c^3 + 40
*b^10*c^2 - 520*a*b^2*c^9 + 1516*a*b^3*c^8 + 144*a*b^4*c^7 - 1564*a*b^5*c^6
 + 228*a*b^6*c^5 + 740*a*b^7*c^4 - 146*a*b^8*c^3 - 164*a*b^9*c^2 - 1624*a^2
*b*c^9 - 112*a^2*b^9*c - 2676*a^3*b*c^8 + 128*a^3*b^8*c - 2588*a^4*b*c^7 +
56*a^4*b^7*c - 1388*a^5*b*c^6 - 184*a^5*b^6*c - 264*a^6*b*c^5 + 80*a^6*b^5*
c + 116*a^7*b*c^4 + 32*a^7*b^4*c + 74*a^8*b*c^3 - 28*a^8*b^3*c + 12*a^9*b*c
^2 + 4*a^9*b^2*c - 1820*a^2*b^2*c^8 + 3576*a^2*b^3*c^7 + 1032*a^2*b^4*c^6 -
 2792*a^2*b^5*c^5 - 236*a^2*b^6*c^4 + 920*a^2*b^7*c^3 + 64*a^2*b^8*c^2 - 35
84*a^3*b^2*c^7 + 4472*a^3*b^3*c^6 + 2236*a^3*b^4*c^5 - 2436*a^3*b^5*c^4 - 7
44*a^3*b^6*c^3 + 464*a^3*b^7*c^2 - 4336*a^4*b^2*c^6 + 3040*a^4*b^3*c^5 + 23
90*a^4*b^4*c^4 - 964*a^4*b^5*c^3 - 592*a^4*b^6*c^2 - 3284*a^5*b^2*c^5 + 908
*a^5*b^3*c^4 + 1364*a^5*b^4*c^3 - 40*a^5*b^5*c^2 - 1500*a^6*b^2*c^4 - 104*a
^6*b^3*c^3 + 384*a^6*b^4*c^2 - 360*a^7*b^2*c^3 - 144*a^7*b^3*c^2 - 24*a^8*b
^2*c^2 - 544*a*b*c^10 + 20*a*b^10*c))/c^8 + (((((2048*(48*a*c^15 + 272*a^2*
c^14 + 576*a^3*c^13 + 576*a^4*c^12 + 272*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^
14 + 20*b^3*c^13 + 18*b^4*c^12 - 46*b^5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12
*b^8*c^8 - 140*a*b^2*c^13 + 288*a*b^3*c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10
 + 74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*
b*c^11 - 144*a^5*b*c^10 - 360*a^2*b^2*c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*
c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^1
0 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 +
8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^14))/c^8 - (2048*tan(x/2)*(-(8*a*
c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1
/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b
c^4(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^
2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*
a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a
c - b^2)^3)^(1/2))/(2(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*(32*a*c
^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 +
 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a
*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10
+ 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^
2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b
^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^8)*(-(8*a*c^7
+ b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2)
- 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4
*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^
3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c -
 b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*tan
(x/2)*(24*b*c^14 - 96*a*c^14 - 8*c^15 + 152*a^2*c^13 + 952*a^3*c^12 + 1096*
a^4*c^11 + 304*a^5*c^10 - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*c^
12 - 7*b^4*c^11 + 39*b^5*c^10 - 15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^
9*c^6 + 24*b^10*c^5 - 8*b^11*c^4 + 68*a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*b^

4*c^10 - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*
a*b^9*c^5 + 8*a*b^10*c^4 - 944*a^2*b*c^12 - 2520*a^3*b*c^11 - 1824*a^4*b*c^
10 - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^11 + 1742*a^2*b^3*c^10 -
1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 1
12*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 1705
*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b
^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*
c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6
+ 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*
a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4
- 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2
) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c -
b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*
c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a
^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*(236*a*c^13 - 32*b*c^13 + 1
2*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11 + 2784*a^4*c^10 + 1948*a^5*c^9 + 780
*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^12 + 121*b^3*c^11 + 61*b^4*c
^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 4
2*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 635*a*b^2*c^11 + 1300*a*b^3*c^10 +
608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8
*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 - 1616*a^2*b*c^11 - 31
60*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*
c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^
5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c
^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^
7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 2
0*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 20
82*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a
^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*
b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2
*c^5 - 404*a*b*c^12))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a
^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 -
18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^
2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2
) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c
- b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*
c^6 - 8*a*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(20*a*b^12 + 42*a*c^12 - 58*b*c
^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9
+ 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 1538*a^4*c^9 - 1278*a^5*c^8 - 4
98*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^11 + 34*b^3*c^
10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89
*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b^2*c^10 - 264*a*b^3*c^9 + 133
9*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4
- 124*a*b^9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b*c^10 - 160*a^2*b^10*c + 3488
*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*b*c^8 - 300*a^4*b^8*c + 1092*a^5*b*c^

7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24*a^6*b^6*c - 440*a^7*b*c^5 - 92*a^8*b
*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^
5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9
*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5
*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2
*c^7 - 5630*a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^
6*c^3 - 740*a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^
4*c^4 + 308*a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*
c^4 - 696*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3
 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b*c^11 + 24*a*b^11*c))/c^8)*(-(8
*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)
^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 -
3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3
*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-
(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(
4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + ((
(((2048*(48*a*c^15 + 272*a^2*c^14 + 576*a^3*c^13 + 576*a^4*c^12 + 272*a^5*c
^11 + 48*a^6*c^10 - 12*b^2*c^14 + 20*b^3*c^13 + 18*b^4*c^12 - 46*b^5*c^11 +
 6*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2*c^13 + 288*a*b^3*c^12 + 3
0*a*b^4*c^11 - 240*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2*b*c^1
3 - 736*a^3*b*c^12 - 544*a^4*b*c^11 - 144*a^5*b*c^10 - 360*a^2*b^2*c^12 + 7
28*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 360*a
^3*b^2*c^11 + 544*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 172*a^4*
b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^14))
/c^8 + (2048*tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^
4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a
*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4
 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 1
0*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2
)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 -
 8*a*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13
 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*
b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 -
56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c
^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10
- 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 9
6*a*b*c^15))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 -
b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2
*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 3
3*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*
b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)
^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a
*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(24*b*c^14 - 96*a*c^14 - 8*c^15 + 152*a^
2*c^13 + 952*a^3*c^12 + 1096*a^4*c^11 + 304*a^5*c^10 - 152*a^6*c^9 - 72*a^7
*c^8 + 2*b^2*c^13 - 38*b^3*c^12 - 7*b^4*c^11 + 39*b^5*c^10 - 15*b^6*c^9 + 3

5*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^10*c^5 - 8*b^11*c^4 + 68*a*b^2*c^
12 + 42*a*b^3*c^11 - 159*a*b^4*c^10 - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*
b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^10*c^4 - 944*a^2*b*c^12 - 25
20*a^3*b*c^11 - 1824*a^4*b*c^10 - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^
2*c^11 + 1742*a^2*b^3*c^10 - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*
b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c
^10 + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c
^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 6
56*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a
^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8)*(-(8*a
*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(
1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*
b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b
^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4
*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*
a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (204
8*(236*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11 + 2784*
a^4*c^10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c
^12 + 121*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 -
 28*b^8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 635*a
*b^2*c^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7
 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^
11*c^2 - 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*a^5*b*c^
8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3*c^9 + 1
420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 23
4*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9 + 6252*
a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^
3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^
3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7
*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^
5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 +
136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8)*(-(8*a*c^7 + b^8 +
24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*
c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*
c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^
3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3
)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)
^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*tan(x/2)*(2
0*a*b^12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^1
1 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 15
38*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*
c^4 + 14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 1
12*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b
^2*c^10 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 +
268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b

*c^10 - 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*b*c^8 - 300*a^4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24*a^6*b^6*c - 440*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630*a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b*c^11 + 24*a*b^11*c))/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2)*2i + (atan((((((2048*(236*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11 + 2784*a^4*c^10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^12 + 121*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 635*a*b^2*c^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 - 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8 + (((2048*tan(x/2)*(24*b*c^14 - 96*a*c^14 - 8*c^15 + 152*a^2*c^13 + 952*a^3*c^12 + 1096*a^4*c^11 + 304*a^5*c^10 - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*c^12 - 7*b^4*c^11 + 39*b^5*c^10 - 15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^10*c^5 - 8*b^11*c^4 + 68*a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*b^4*c^10 - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^10*c^4 - 944*a^2* b*c^12 - 2520*a^3*b*c^11 - 1824*a^4*b*c^10 - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^11 + 1742*a^2*b^3*c^10 - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8 + (((2048*(48*a*c^15 + 272*a^2*c^14 + 576*a^3*c^13 + 576*a^4*c^12 + 272*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^14 + 20*b^3*c^13 + 18*b^4*c^12 - 46*b^5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2*c^13 + 288*a*b^3*c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*b*c^11 - 144*a^5*b*c^10 - 360*a^2*b^2*c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^14))/c^8 - (2048*tan(x/2)*(a*c*1i - b^2*1i + (c^2*3i)/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^11)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3 - (2048*tan(x/2)*(20*a*b^12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 1538*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b^2*c^10 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b*c^10 - 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*b*c^8 - 300*a^4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24*a^6*b^6*c - 440*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630*a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b*c^11 + 24*a*b^11*c))/c^8)*(a*c*1i - b^2*1i + (c^2*3i)/2)*1i)/c^3 - (((((2048*(236*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11 + 2784*a^4*c^10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^12 + 121*b^3*c^11 + 61*b^4*c^10 - 220*b^

5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 635*a*b^2*c^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 - 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8 - (((2048*tan(x/2)*(24*b*c^14 - 96*a*c^14 - 8*c^15 + 152*a^2*c^13 + 952*a^3*c^12 + 1096*a^4*c^11 + 304*a^5*c^10 - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*c^12 - 7*b^4*c^11 + 39*b^5*c^10 - 15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^10*c^5 - 8*b^11*c^4 + 68*a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*b^4*c^10 - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^10*c^4 - 944*a^2*b*c^12 - 2520*a^3*b*c^11 - 1824*a^4*b*c^10 - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^11 + 1742*a^2*b^3*c^10 - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8 - (((2048*(48*a*c^15 + 272*a^2*c^14 + 576*a^3*c^13 + 576*a^4*c^12 + 272*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^14 + 20*b^3*c^13 + 18*b^4*c^12 - 46*b^5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2*c^13 + 288*a*b^3*c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*b*c^11 - 144*a^5*b*c^10 - 360*a^2*b^2*c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^14))/c^8 + (2048*tan(x/2)*(a*c*1i - b^2*1i + (c^2*3i)/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^11)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3 + (2048*tan(x/2)*(20*a*b^12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 1538*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6

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+ 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5
*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 +
 28*b^11*c^2 - 518*a*b^2*c^10 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c
^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a
*b^10*c^2 + 1550*a^2*b*c^10 - 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9
*c + 3350*a^4*b*c^8 - 300*a^4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*
a^6*b*c^6 - 24*a^6*b^6*c - 440*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9
- 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5
 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 -
 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4
- 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630*a^4*b^3*c^6
- 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*c^2
+ 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*c^3
+ 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a^6*b^4*c^3 -
300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a
^8*b^2*c^3 + 148*a*b*c^11 + 24*a*b^11*c))/c^8)*(a*c*1i - b^2*1i + (c^2*3i)/
2)*1i)/c^3)/((4096*(16*a*b^11 + 274*a*c^11 - 78*b*c^11 + 4*b^11*c - 4*b^12
+ 33*c^12 - 16*a^2*b^10 - 16*a^3*b^9 + 40*a^4*b^8 - 16*a^5*b^7 - 16*a^6*b^6
 + 16*a^7*b^5 - 4*a^8*b^4 + 1008*a^2*c^10 + 2156*a^3*c^9 + 2954*a^4*c^8 + 2
688*a^5*c^7 + 1624*a^6*c^6 + 628*a^7*c^5 + 141*a^8*c^4 + 14*a^9*c^3 - 64*b^
2*c^10 + 268*b^3*c^9 - 26*b^4*c^8 - 348*b^5*c^7 + 144*b^6*c^6 + 208*b^7*c^5
 - 123*b^8*c^4 - 54*b^9*c^3 + 40*b^10*c^2 - 520*a*b^2*c^9 + 1516*a*b^3*c^8
+ 144*a*b^4*c^7 - 1564*a*b^5*c^6 + 228*a*b^6*c^5 + 740*a*b^7*c^4 - 146*a*b^
8*c^3 - 164*a*b^9*c^2 - 1624*a^2*b*c^9 - 112*a^2*b^9*c - 2676*a^3*b*c^8 + 1
28*a^3*b^8*c - 2588*a^4*b*c^7 + 56*a^4*b^7*c - 1388*a^5*b*c^6 - 184*a^5*b^6
*c - 264*a^6*b*c^5 + 80*a^6*b^5*c + 116*a^7*b*c^4 + 32*a^7*b^4*c + 74*a^8*b
*c^3 - 28*a^8*b^3*c + 12*a^9*b*c^2 + 4*a^9*b^2*c - 1820*a^2*b^2*c^8 + 3576*
a^2*b^3*c^7 + 1032*a^2*b^4*c^6 - 2792*a^2*b^5*c^5 - 236*a^2*b^6*c^4 + 920*a
^2*b^7*c^3 + 64*a^2*b^8*c^2 - 3584*a^3*b^2*c^7 + 4472*a^3*b^3*c^6 + 2236*a^
3*b^4*c^5 - 2436*a^3*b^5*c^4 - 744*a^3*b^6*c^3 + 464*a^3*b^7*c^2 - 4336*a^4
*b^2*c^6 + 3040*a^4*b^3*c^5 + 2390*a^4*b^4*c^4 - 964*a^4*b^5*c^3 - 592*a^4*
b^6*c^2 - 3284*a^5*b^2*c^5 + 908*a^5*b^3*c^4 + 1364*a^5*b^4*c^3 - 40*a^5*b^
5*c^2 - 1500*a^6*b^2*c^4 - 104*a^6*b^3*c^3 + 384*a^6*b^4*c^2 - 360*a^7*b^2*
c^3 - 144*a^7*b^3*c^2 - 24*a^8*b^2*c^2 - 544*a*b*c^10 + 20*a*b^10*c))/c^8 +
 (((((2048*(236*a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^1
1 + 2784*a^4*c^10 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 -
 39*b^2*c^12 + 121*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*
b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^
2 - 635*a*b^2*c^11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*
a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3
+ 20*a*b^11*c^2 - 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132
*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^
3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7
*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^
9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5
```

+ 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 50
25*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 15
6*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a
^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b
^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8 + (((2048*t
an(x/2)*(24*b*c^14 - 96*a*c^14 - 8*c^15 + 152*a^2*c^13 + 952*a^3*c^12 + 109
6*a^4*c^11 + 304*a^5*c^10 - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*
c^12 - 7*b^4*c^11 + 39*b^5*c^10 - 15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*
b^9*c^6 + 24*b^10*c^5 - 8*b^11*c^4 + 68*a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*
b^4*c^10 - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 7
2*a*b^9*c^5 + 8*a*b^10*c^4 - 944*a^2*b*c^12 - 2520*a^3*b*c^11 - 1824*a^4*b*
c^10 - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^11 + 1742*a^2*b^3*c^10
- 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 -
112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 17
05*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3
*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^
5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^
6 + 256*a^6*b^2*c^7 + 136*a*b*c^13))/c^8 + (((2048*(48*a*c^15 + 272*a^2*c^1
4 + 576*a^3*c^13 + 576*a^4*c^12 + 272*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^14
+ 20*b^3*c^13 + 18*b^4*c^12 - 46*b^5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12*b^
8*c^8 - 140*a*b^2*c^13 + 288*a*b^3*c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10 +
74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*b*c
^11 - 144*a^5*b*c^10 - 360*a^2*b^2*c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*c^1
0 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^10 +
10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a
^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^14))/c^8 - (2048*tan(x/2)*(a*c*1i -
b^2*1i + (c^2*3i)/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13
+ 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b
^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 5
6*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^
12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 -
272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96
*a*b*c^15))/c^11)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3)*(a*c*1i - b^2*1i + (
c^2*3i)/2))/c^3)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3 - (2048*tan(x/2)*(20*a
*b^12 + 42*a*c^12 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^11 +
40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 1538*
a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4
+ 14*b^2*c^11 + 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*
b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b^2*
c^10 - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268
*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b*c^
10 - 160*a^2*b^10*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*b*c^8 - 300
*a^4*b^8*c + 1092*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24*a^6*b^6*c
- 440*a^7*b*c^5 - 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564
*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048

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*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*
a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*
a^3*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630*a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563
*a^4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740*a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456
*a^5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308*a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*
a^6*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7
*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b*c^11
 + 24*a*b^11*c))/c^8)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3 + (((((2048*(236*
a*c^13 - 32*b*c^13 + 12*c^14 + 1084*a^2*c^12 + 2328*a^3*c^11 + 2784*a^4*c^1
0 + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^12 + 1
21*b^3*c^11 + 61*b^4*c^10 - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^8
*c^6 - 127*b^9*c^5 + 42*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 635*a*b^2*c^
11 + 1300*a*b^3*c^10 + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 1218
*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2
- 1616*a^2*b*c^11 - 3160*a^3*b*c^10 - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 704
*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^10 + 4146*a^2*b^3*c^9 + 1420*a^2
*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*b
^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^3
*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c
^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 +
 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7*c^3 +
8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^5 - 388
*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6
*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^12))/c^8 - (((2048*tan(x/2)*(24*b*c^
14 - 96*a*c^14 - 8*c^15 + 152*a^2*c^13 + 952*a^3*c^12 + 1096*a^4*c^11 + 304
*a^5*c^10 - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^13 - 38*b^3*c^12 - 7*b^4*c^1
1 + 39*b^5*c^10 - 15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^1
0*c^5 - 8*b^11*c^4 + 68*a*b^2*c^12 + 42*a*b^3*c^11 - 159*a*b^4*c^10 - 400*a
*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*
a*b^10*c^4 - 944*a^2*b*c^12 - 2520*a^3*b*c^11 - 1824*a^4*b*c^10 - 272*a^5*b
*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^11 + 1742*a^2*b^3*c^10 - 1645*a^2*b^4*c
^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5
 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^10 + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 -
 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a
^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b
^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*
c^7 + 136*a*b*c^13))/c^8 - (((2048*(48*a*c^15 + 272*a^2*c^14 + 576*a^3*c^13
 + 576*a^4*c^12 + 272*a^5*c^11 + 48*a^6*c^10 - 12*b^2*c^14 + 20*b^3*c^13 +
18*b^4*c^12 - 46*b^5*c^11 + 6*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^
2*c^13 + 288*a*b^3*c^12 + 30*a*b^4*c^11 - 240*a*b^5*c^10 + 74*a*b^6*c^9 + 2
0*a*b^7*c^8 - 416*a^2*b*c^13 - 736*a^3*b*c^12 - 544*a^4*b*c^11 - 144*a^5*b*
c^10 - 360*a^2*b^2*c^12 + 728*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*
c^9 + 4*a^2*b^6*c^8 - 360*a^3*b^2*c^11 + 544*a^3*b^3*c^10 + 10*a^3*b^4*c^9
- 20*a^3*b^5*c^8 - 172*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*
a^5*b^2*c^9 - 80*a*b*c^14))/c^8 + (2048*tan(x/2)*(a*c*1i - b^2*1i + (c^2*3i
```

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)/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 -
8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*
c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8
*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2
*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^1
2 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^11
)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3)
*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3 + (2048*tan(x/2)*(20*a*b^12 + 42*a*c^1
2 - 58*b*c^12 + 4*b^12*c - 4*b^13 + 22*c^13 - 40*a^2*b^11 + 40*a^3*b^10 - 2
0*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^11 - 938*a^3*c^10 - 1538*a^4*c^9 - 1278*a
^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^11 +
 34*b^3*c^10 + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 105*b^
8*c^5 - 89*b^9*c^4 - 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b^2*c^10 - 264*a*b^3
*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 + 649
*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b*c^10 - 160*a^2*b^1
0*c + 3488*a^3*b*c^9 + 320*a^3*b^9*c + 3350*a^4*b*c^8 - 300*a^4*b^8*c + 109
2*a^5*b*c^7 + 136*a^5*b^7*c - 462*a^6*b*c^6 - 24*a^6*b^6*c - 440*a^7*b*c^5
- 92*a^8*b*c^4 - 1568*a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1
964*a^2*b^5*c^6 - 2790*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 2
76*a^2*b^9*c^2 - 652*a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6 + 49
88*a^3*b^5*c^5 - 1118*a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2 + 23
50*a^4*b^2*c^7 - 5630*a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1
260*a^4*b^6*c^3 - 740*a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2
771*a^5*b^4*c^4 + 308*a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5 + 57
6*a^6*b^3*c^4 - 696*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 272*a
^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b*c^11 + 24*a*b^11*c))
/c^8)*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3))*(a*c*1i - b^2*1i + (c^2*3i)/2)*
2i)/c^3
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)**4/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Timed out
```

3.7 $\int \frac{\sin^2(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=260

$$\frac{2\left(b-\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{c\sqrt{-\sqrt{b^2-4ac}+b-2c}\,\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2\left(\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}+b\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{c\sqrt{\sqrt{b^2-4ac}+b-2c}\,\sqrt{\sqrt{b^2-4ac}+b+2c}}-\frac{x}{c}$$

```
[Out] -x/c+2*arctan((b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c-(-4*a*c+b^
2)^(1/2))^(1/2))*(b+(-b^2+2*c*(a+c))/(-4*a*c+b^2)^(1/2))/c/(b-2*c-(-4*a*c+b
^2)^(1/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)+2*arctan((b-2*c+(-4*a*c+b
^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2))*(b+(b^2-2*c*(
a+c))/(-4*a*c+b^2)^(1/2))/c/(b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*c+(-4*a*c
+b^2)^(1/2))^(1/2)
```

Rubi [A] time = 1.28, antiderivative size = 260, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {3267, 3293, 2659, 205}

$$\frac{2\left(b-\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{c\sqrt{-\sqrt{b^2-4ac}+b-2c}\,\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2\left(\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}+b\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{c\sqrt{\sqrt{b^2-4ac}+b-2c}\,\sqrt{\sqrt{b^2-4ac}+b+2c}}-\frac{x}{c}$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]^2/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] -(x/c) + (2*(b - (b^2 - 2*c*(a + c))/Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*
c - Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/(c*Sqr
t[b - 2*c - Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]) + (2*(b +
 (b^2 - 2*c*(a + c))/Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c + Sqrt[b^2 - 4
*a*c]]*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]])/(c*Sqrt[b - 2*c + Sqrt
[b^2 - 4*a*c]]*Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
```

```
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3267

```
Int[((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b_.) + cos[(d_.) + (e_.)*(x_)]^
(n2_.)*(c_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandT
rig[(1 - cos[d + e*x]^2)^(m/2)*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n)
)^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && IntegerQ[m/2] &
& NeQ[b^2 - 4*a*c, 0] && IntegersQ[n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rubi steps

$$\int \frac{\sin^2(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(-\frac{1}{c}+\frac{a\left(1+\frac{c}{a}\right)+b\cos(x)}{c\left(a+b\cos(x)+c\cos^2(x)\right)}\right)dx$$

$$= -\frac{x}{c}+\frac{\int \frac{a\left(1+\frac{c}{a}\right)+b\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{c}$$

$$= -\frac{x}{c}+\frac{\left(b-\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\int \frac{1}{b-\sqrt{b^2-4ac}+2c\cos(x)}\,dx}{c}+\frac{\left(b+\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\int \frac{1}{b+\sqrt{b^2-4ac}+2c\cos}}{c}$$

$$= -\frac{x}{c}+\frac{\left(2\left(b-\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\right)\text{Subst}\left(\int \frac{1}{b+2c-\sqrt{b^2-4ac}+\left(b-2c-\sqrt{b^2-4ac}\right)x^2}\,dx, x, \tan\left(\frac{x}{2}\right)\right)}{c}$$

$$= -\frac{x}{c}+\frac{2\left(b-\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{c\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}}+\frac{2\left(b+\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\right.}{c\sqrt{b-2c+\sqrt{b^2-4ac}}\,\sqrt{}}$$

Mathematica [A] time = 0.63, size = 238, normalized size = 0.92

$$\frac{x\left(-\sqrt{b^2-4ac}\right)-\frac{\left(b\sqrt{b^2-4ac}-2c(a+c)+b^2\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{-\frac{1}{2}b\sqrt{b^2-4ac}+c(a+c)-\frac{b^2}{2}}}+\sqrt{2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}\,\tanh^{-1}\left(-\right.}{c\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]^2/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (-(Sqrt[b^2 - 4*a*c]*x) - ((b^2 - 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c])*ArcTan
h[((b - 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) - 2*b*
Sqrt[b^2 - 4*a*c]]])/Sqrt[-1/2*b^2 + c*(a + c) - (b*Sqrt[b^2 - 4*a*c])/2] +
 Sqrt[-2*b^2 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c]]*ArcTanh[((-b + 2*c + Sq
rt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c
]]])/(c*Sqrt[b^2 - 4*a*c])
```

fricas [B] time = 1.11, size = 971, normalized size = 3.73

$$-\frac{\sqrt{2}\,c\sqrt{-\frac{b^2-2\,ac-2\,c^2+\left(b^2c^2-4\,ac^3\right)\sqrt{\frac{b^2}{b^2c^4-4\,ac^5}}}{b^2c^2-4\,ac^3}}\,\log\left(\sqrt{2}\left(b^2c^3-4\,ac^4\right)\sqrt{\frac{b^2}{b^2c^4-4\,ac^5}}\sqrt{-\frac{b^2-2\,ac-2\,c^2+\left(b^2c^2-4\,ac^3\right)\sqrt{\frac{b^2}{b^2c^4-4\,ac^5}}}{b^2c^2-4\,ac^3}}\,\mathrm{si}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(2)*c*sqrt(-(b^2 - 2*a*c - 2*c^2 + (b^2*c^2 - 4*a*c^3)*sqrt(b^2/(
b^2*c^4 - 4*a*c^5)))/(b^2*c^2 - 4*a*c^3))*log(sqrt(2)*(b^2*c^3 - 4*a*c^4)*s
qrt(b^2/(b^2*c^4 - 4*a*c^5))*sqrt(-(b^2 - 2*a*c - 2*c^2 + (b^2*c^2 - 4*a*c^
3)*sqrt(b^2/(b^2*c^4 - 4*a*c^5)))/(b^2*c^2 - 4*a*c^3))*sin(x) + b^2*cos(x)
+ (b^2*c^2 - 4*a*c^3)*sqrt(b^2/(b^2*c^4 - 4*a*c^5))*cos(x) + 2*b*c) - sqrt(
2)*c*sqrt(-(b^2 - 2*a*c - 2*c^2 + (b^2*c^2 - 4*a*c^3)*sqrt(b^2/(b^2*c^4 - 4
*a*c^5)))/(b^2*c^2 - 4*a*c^3))*log(-sqrt(2)*(b^2*c^3 - 4*a*c^4)*sqrt(b^2/(b
^2*c^4 - 4*a*c^5))*sqrt(-(b^2 - 2*a*c - 2*c^2 + (b^2*c^2 - 4*a*c^3)*sqrt(b^
2/(b^2*c^4 - 4*a*c^5)))/(b^2*c^2 - 4*a*c^3))*sin(x) + b^2*cos(x) + (b^2*c^2
 - 4*a*c^3)*sqrt(b^2/(b^2*c^4 - 4*a*c^5))*cos(x) + 2*b*c) + sqrt(2)*c*sqrt(
-(b^2 - 2*a*c - 2*c^2 - (b^2*c^2 - 4*a*c^3)*sqrt(b^2/(b^2*c^4 - 4*a*c^5)))/
(b^2*c^2 - 4*a*c^3))*log(sqrt(2)*(b^2*c^3 - 4*a*c^4)*sqrt(b^2/(b^2*c^4 - 4*
a*c^5))*sqrt(-(b^2 - 2*a*c - 2*c^2 - (b^2*c^2 - 4*a*c^3)*sqrt(b^2/(b^2*c^4
- 4*a*c^5)))/(b^2*c^2 - 4*a*c^3))*sin(x) - b^2*cos(x) + (b^2*c^2 - 4*a*c^3)
*sqrt(b^2/(b^2*c^4 - 4*a*c^5))*cos(x) - 2*b*c) - sqrt(2)*c*sqrt(-(b^2 - 2*a
```

```
*c - 2*c^2 - (b^2*c^2 - 4*a*c^3)*sqrt(b^2/(b^2*c^4 - 4*a*c^5)))/(b^2*c^2 -
4*a*c^3))*log(-sqrt(2)*(b^2*c^3 - 4*a*c^4)*sqrt(b^2/(b^2*c^4 - 4*a*c^5))*sq
rt(-(b^2 - 2*a*c - 2*c^2 - (b^2*c^2 - 4*a*c^3)*sqrt(b^2/(b^2*c^4 - 4*a*c^5)
))/(b^2*c^2 - 4*a*c^3))*sin(x) - b^2*cos(x) + (b^2*c^2 - 4*a*c^3)*sqrt(b^2/
(b^2*c^4 - 4*a*c^5))*cos(x) - 2*b*c) + 4*x)/c
```

giac [B] time = 177.35, size = 6564, normalized size = 25.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] -x/c - ((2*a^2*b^4 - 4*a*b^5 + 2*b^6 - 16*a^3*b^2*c + 32*a^2*b^3*c - 12*a*b
^4*c - 4*b^5*c + 32*a^4*c^2 - 64*a^3*b*c^2 + 32*a*b^3*c^2 + 2*b^4*c^2 + 64*
a^3*c^3 - 64*a^2*b*c^3 - 16*a*b^2*c^3 + 32*a^2*c^4 + 3*sqrt(a^2 - a*b + b*c
 - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b^2 - 2*(b^2
- 4*a*c)*a^2*b^2 - 2*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b
+ c))*sqrt(b^2 - 4*a*c)*a*b^3 + 4*(b^2 - 4*a*c)*a*b^3 - 5*sqrt(a^2 - a*b +
b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^4 - 2*(b^2 -
 4*a*c)*b^4 - 12*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c)
)*sqrt(b^2 - 4*a*c)*a^3*c + 8*(b^2 - 4*a*c)*a^3*c + 8*sqrt(a^2 - a*b + b*c
- c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b*c - 16*(b^2
- 4*a*c)*a^2*b*c + 34*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b
 + c))*sqrt(b^2 - 4*a*c)*a*b^2*c + 4*(b^2 - 4*a*c)*a*b^2*c + 6*sqrt(a^2 - a
*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^3*c + 4
*(b^2 - 4*a*c)*b^3*c - 56*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a
 - b + c))*sqrt(b^2 - 4*a*c)*a^2*c^2 + 16*(b^2 - 4*a*c)*a^2*c^2 - 24*sqrt(a
^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b
*c^2 - 16*(b^2 - 4*a*c)*a*b*c^2 - 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 -
 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^2*c^2 - 2*(b^2 - 4*a*c)*b^2*c^2 +
20*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4
*a*c)*a*c^3 + 8*(b^2 - 4*a*c)*a*c^3)*c^2*abs(a - b + c) + (4*a^2*b^4*c - 4*
b^6*c - 32*a^3*b^2*c^2 + 40*a*b^4*c^2 + 64*a^4*c^3 - 128*a^2*b^2*c^3 + 4*b^
4*c^3 + 128*a^3*c^4 - 32*a*b^2*c^4 + 64*a^2*c^5 - 3*sqrt(a^2 - a*b + b*c -
c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*b^2*c - sqrt(a^2 - a*b + b*c - c^2
 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b^3*c + 7*sqrt(a^2 - a*b + b*c - c^2
- sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^4*c + 5*sqrt(a^2 - a*b + b*c - c^2 - s
qrt(b^2 - 4*a*c)*(a - b + c))*b^5*c + 12*sqrt(a^2 - a*b + b*c - c^2 - sqrt(
b^2 - 4*a*c)*(a - b + c))*a^4*c^2 + 4*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2
 - 4*a*c)*(a - b + c))*a^3*b*c^2 - 45*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2
 - 4*a*c)*(a - b + c))*a^2*b^2*c^2 - 38*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b
^2 - 4*a*c)*(a - b + c))*a*b^3*c^2 - sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2
- 4*a*c)*(a - b + c))*b^4*c^2 + 68*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 -
4*a*c)*(a - b + c))*a^3*c^3 + 72*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*
```

```
a*c)*(a - b + c))*a^2*b*c^3 - 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a
*c)*(a - b + c))*a*b^2*c^3 - sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)
*(a - b + c))*b^3*c^3 + 36*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(
a - b + c))*a^2*c^4 + 4*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a -
 b + c))*a*b*c^4 + 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b
+ c))*b^2*c^4 - 20*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b +
c))*a*c^5 - 4*(b^2 - 4*a*c)*a^2*b^2*c + 4*(b^2 - 4*a*c)*b^4*c + 16*(b^2 - 4
*a*c)*a^3*c^2 - 24*(b^2 - 4*a*c)*a*b^2*c^2 + 32*(b^2 - 4*a*c)*a^2*c^3 - 4*(
b^2 - 4*a*c)*b^2*c^3 + 16*(b^2 - 4*a*c)*a*c^4)*abs(a - b + c)*abs(c) + (2*a
^3*b^3*c^2 - 4*a^2*b^4*c^2 + 2*a*b^5*c^2 - 8*a^4*b*c^3 + 20*a^3*b^2*c^3 - 1
4*a^2*b^3*c^3 + 4*a*b^4*c^3 - 2*b^5*c^3 - 16*a^4*c^4 + 24*a^3*b*c^4 - 12*a^
2*b^2*c^4 + 6*a*b^3*c^4 - 16*a^3*c^5 + 8*a^2*b*c^5 - 4*a*b^2*c^5 + 6*b^3*c^
5 + 16*a^2*c^6 - 24*a*b*c^6 - 4*b^2*c^6 + 16*a*c^7 + 3*sqrt(a^2 - a*b + b*c
 - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*b*c^2 - 2*(b^
2 - 4*a*c)*a^3*b*c^2 - 2*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a
- b + c))*sqrt(b^2 - 4*a*c)*a^2*b^2*c^2 + 4*(b^2 - 4*a*c)*a^2*b^2*c^2 - 5*s
qrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c
)*a*b^3*c^2 - 2*(b^2 - 4*a*c)*a*b^3*c^2 + 6*sqrt(a^2 - a*b + b*c - c^2 - sq
rt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*c^3 - 4*(b^2 - 4*a*c)*a^
3*c^3 + 7*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(
b^2 - 4*a*c)*a^2*b*c^3 + 6*(b^2 - 4*a*c)*a^2*b*c^3 - 2*sqrt(a^2 - a*b + b*c
 - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^2*c^3 - 4*(b^
2 - 4*a*c)*a*b^2*c^3 + 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a
- b + c))*sqrt(b^2 - 4*a*c)*b^3*c^3 + 2*(b^2 - 4*a*c)*b^3*c^3 + 22*sqrt(a^2
 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*c
^4 - 4*(b^2 - 4*a*c)*a^2*c^4 - 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*
a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b*c^4 + 2*(b^2 - 4*a*c)*a*b*c^4 + 4*s
qrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c
)*b^2*c^4 - 38*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*
sqrt(b^2 - 4*a*c)*a*c^5 + 4*(b^2 - 4*a*c)*a*c^5 - 7*sqrt(a^2 - a*b + b*c -
c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b*c^5 - 6*(b^2 - 4*a
*c)*b*c^5 + 10*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*
sqrt(b^2 - 4*a*c)*c^6 + 4*(b^2 - 4*a*c)*c^6)*abs(a - b + c))*(pi*floor(1/2*
x/pi + 1/2) + arctan(2*sqrt(1/2)*tan(1/2*x)/sqrt((2*a*c - 2*c^2 + sqrt(-4*(
a*c + b*c + c^2)*(a*c - b*c + c^2) + 4*(a*c - c^2)^2))/(a*c - b*c + c^2))))
/((3*a^5*b^2*c^2 - 5*a^4*b^3*c^2 - 6*a^3*b^4*c^2 + 10*a^2*b^5*c^2 + 3*a*b^6
*c^2 - 5*b^7*c^2 - 12*a^6*c^3 + 20*a^5*b*c^3 + 47*a^4*b^2*c^3 - 60*a^3*b^3*
c^3 - 46*a^2*b^4*c^3 + 40*a*b^5*c^3 + 11*b^6*c^3 - 92*a^5*c^4 + 80*a^4*b*c^
4 + 182*a^3*b^2*c^4 - 94*a^2*b^3*c^4 - 78*a*b^4*c^4 - 6*b^5*c^4 - 184*a^4*c
^5 + 56*a^3*b*c^5 + 166*a^2*b^2*c^5 + 36*a*b^3*c^5 - 6*b^4*c^5 - 120*a^3*c^
6 - 48*a^2*b*c^6 + 23*a*b^2*c^6 + 11*b^3*c^6 + 4*a^2*c^7 - 44*a*b*c^7 - 5*b
^2*c^7 + 20*a*c^8)*abs(c)) + ((2*a^2*b^4 - 4*a*b^5 + 2*b^6 - 16*a^3*b^2*c +
 32*a^2*b^3*c - 12*a*b^4*c - 4*b^5*c + 32*a^4*c^2 - 64*a^3*b*c^2 + 32*a*b^3
*c^2 + 2*b^4*c^2 + 64*a^3*c^3 - 64*a^2*b*c^3 - 16*a*b^2*c^3 + 32*a^2*c^4 +
3*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*
```

```
a*c)*a^2*b^2 - 2*(b^2 - 4*a*c)*a^2*b^2 - 2*sqrt(a^2 - a*b + b*c - c^2 + sqr
t(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^3 + 4*(b^2 - 4*a*c)*a*b^3
 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 -
 4*a*c)*b^4 - 2*(b^2 - 4*a*c)*b^4 - 12*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^
2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*c + 8*(b^2 - 4*a*c)*a^3*c + 8
*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a
*c)*a^2*b*c - 16*(b^2 - 4*a*c)*a^2*b*c + 34*sqrt(a^2 - a*b + b*c - c^2 + sq
rt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^2*c + 4*(b^2 - 4*a*c)*a*
b^2*c + 6*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(
b^2 - 4*a*c)*b^3*c + 4*(b^2 - 4*a*c)*b^3*c - 56*sqrt(a^2 - a*b + b*c - c^2
+ sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*c^2 + 16*(b^2 - 4*a*
c)*a^2*c^2 - 24*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))
*sqrt(b^2 - 4*a*c)*a*b*c^2 - 16*(b^2 - 4*a*c)*a*b*c^2 - 5*sqrt(a^2 - a*b +
b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^2*c^2 - 2*(b
^2 - 4*a*c)*b^2*c^2 + 20*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a
- b + c))*sqrt(b^2 - 4*a*c)*a*c^3 + 8*(b^2 - 4*a*c)*a*c^3)*c^2*abs(a - b +
c) + (4*a^2*b^4*c - 4*b^6*c - 32*a^3*b^2*c^2 + 40*a*b^4*c^2 + 64*a^4*c^3 -
128*a^2*b^2*c^3 + 4*b^4*c^3 + 128*a^3*c^4 - 32*a*b^2*c^4 + 64*a^2*c^5 + 3*s
qrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*b^2*c + sqrt
(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b^3*c - 7*sqrt(
a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^4*c - 5*sqrt(a^2
 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*b^5*c - 12*sqrt(a^2 - a
*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^4*c^2 - 4*sqrt(a^2 - a*b
+ b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*b*c^2 + 45*sqrt(a^2 - a*b
+ b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b^2*c^2 + 38*sqrt(a^2 - a*
b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^3*c^2 + sqrt(a^2 - a*b +
 b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*b^4*c^2 - 68*sqrt(a^2 - a*b + b
*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*c^3 - 72*sqrt(a^2 - a*b + b*c
 - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b*c^3 + 5*sqrt(a^2 - a*b + b*c
- c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^2*c^3 + sqrt(a^2 - a*b + b*c - c
^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*b^3*c^3 - 36*sqrt(a^2 - a*b + b*c - c^2
 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*c^4 - 4*sqrt(a^2 - a*b + b*c - c^2 +
sqrt(b^2 - 4*a*c)*(a - b + c))*a*b*c^4 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqr
t(b^2 - 4*a*c)*(a - b + c))*b^2*c^4 + 20*sqrt(a^2 - a*b + b*c - c^2 + sqrt(
b^2 - 4*a*c)*(a - b + c))*a*c^5 - 4*(b^2 - 4*a*c)*a^2*b^2*c + 4*(b^2 - 4*a*
c)*b^4*c + 16*(b^2 - 4*a*c)*a^3*c^2 - 24*(b^2 - 4*a*c)*a*b^2*c^2 + 32*(b^2
- 4*a*c)*a^2*c^3 - 4*(b^2 - 4*a*c)*b^2*c^3 + 16*(b^2 - 4*a*c)*a*c^4)*abs(a
- b + c)*abs(c) + (2*a^3*b^3*c^2 - 4*a^2*b^4*c^2 + 2*a*b^5*c^2 - 8*a^4*b*c^
3 + 20*a^3*b^2*c^3 - 14*a^2*b^3*c^3 + 4*a*b^4*c^3 - 2*b^5*c^3 - 16*a^4*c^4
+ 24*a^3*b*c^4 - 12*a^2*b^2*c^4 + 6*a*b^3*c^4 - 16*a^3*c^5 + 8*a^2*b*c^5 -
4*a*b^2*c^5 + 6*b^3*c^5 + 16*a^2*c^6 - 24*a*b*c^6 - 4*b^2*c^6 + 16*a*c^7 +
3*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*
a*c)*a^3*b*c^2 - 2*(b^2 - 4*a*c)*a^3*b*c^2 - 2*sqrt(a^2 - a*b + b*c - c^2 +
 sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b^2*c^2 + 4*(b^2 - 4*
a*c)*a^2*b^2*c^2 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b
```

```
+ c))*sqrt(b^2 - 4*a*c)*a*b^3*c^2 - 2*(b^2 - 4*a*c)*a*b^3*c^2 + 6*sqrt(a^2
- a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*c^
3 - 4*(b^2 - 4*a*c)*a^3*c^3 + 7*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a
*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b*c^3 + 6*(b^2 - 4*a*c)*a^2*b*c^3 -
2*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*
a*c)*a*b^2*c^3 - 4*(b^2 - 4*a*c)*a*b^2*c^3 + 5*sqrt(a^2 - a*b + b*c - c^2 +
 sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^3*c^3 + 2*(b^2 - 4*a*c)
*b^3*c^3 + 22*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*s
qrt(b^2 - 4*a*c)*a^2*c^4 - 4*(b^2 - 4*a*c)*a^2*c^4 - 3*sqrt(a^2 - a*b + b*c
 - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b*c^4 + 2*(b^2
- 4*a*c)*a*b*c^4 + 4*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b
+ c))*sqrt(b^2 - 4*a*c)*b^2*c^4 - 38*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2
- 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*c^5 + 4*(b^2 - 4*a*c)*a*c^5 - 7*s
qrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c
)*b*c^5 - 6*(b^2 - 4*a*c)*b*c^5 + 10*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2
- 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*c^6 + 4*(b^2 - 4*a*c)*c^6)*abs(a -
b + c))*(pi*floor(1/2*x/pi + 1/2) + arctan(2*sqrt(1/2)*tan(1/2*x)/sqrt((2*a
*c - 2*c^2 - sqrt(-4*(a*c + b*c + c^2)*(a*c - b*c + c^2) + 4*(a*c - c^2)^2)
)/(a*c - b*c + c^2))))/((3*a^5*b^2*c^2 - 5*a^4*b^3*c^2 - 6*a^3*b^4*c^2 + 10
*a^2*b^5*c^2 + 3*a*b^6*c^2 - 5*b^7*c^2 - 12*a^6*c^3 + 20*a^5*b*c^3 + 47*a^4
*b^2*c^3 - 60*a^3*b^3*c^3 - 46*a^2*b^4*c^3 + 40*a*b^5*c^3 + 11*b^6*c^3 - 92
*a^5*c^4 + 80*a^4*b*c^4 + 182*a^3*b^2*c^4 - 94*a^2*b^3*c^4 - 78*a*b^4*c^4 -
 6*b^5*c^4 - 184*a^4*c^5 + 56*a^3*b*c^5 + 166*a^2*b^2*c^5 + 36*a*b^3*c^5 -
6*b^4*c^5 - 120*a^3*c^6 - 48*a^2*b*c^6 + 23*a*b^2*c^6 + 11*b^3*c^6 + 4*a^2*
c^7 - 44*a*b*c^7 - 5*b^2*c^7 + 20*a*c^8)*abs(c))
```

maple [B] time = 0.11, size = 1157, normalized size = 4.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)^2/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 1/c*a/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/
(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))+1/c*a/(-4*a*c+b^2)^(1/2)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)
^(1/2)-a+c)*(a-b+c))^(1/2))*b+2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a
+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a
-b+c))^(1/2))+1/c*a/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))-1/c*a/(-4*a*c+b^2)^(1
/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-
4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b-2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^
2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)
+a-c)*(a-b+c))^(1/2))-1/c*b/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctan
h((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))-1/c/(-4*a*c
```

```
+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^2-b/(-4*a*c+b^2)^(1/2)/((
(-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))-1/c*b/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^
(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))+1
/c/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+
c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2+b/(-4*a*c+b^2)^
(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/((
(-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))+1/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c)
)^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2
))+2*c/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh(
(-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))+1/(((-4*a*c+b
^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2
)+a-c)*(a-b+c))^(1/2))-2*c/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-
b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1
/2))-2/c*arctan(tan(1/2*x))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2c\int\frac{2\,b^2\cos(3\,x)^2+2\,b^2\cos(x)^2+2\,b^2\sin(3\,x)^2+2\,b^2\sin(x)^2+4\left(2\,a^2+3\,ac+c^2\right)\cos(2\,x)^2+bc\cos(x)+4\left(2\,a^2+3\,ac+c\right.}{c^3\cos(4\,x)^2+4\,b^2c\cos(3\,x)^2+4\,b^2c\cos(x)^2+c^3\sin(4\,x)^2+4\,b^2c\sin(3\,x)^2+4\,b^2c\sin(x)^2+4\,bc^2\cos(x)+c^3+4\left(4\,a^2c+4\,ac^2+c^3\right)\cos(2\,x)^2+4\left(4\,a^2c+4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] (c*integrate(2*(2*b^2*cos(3*x)^2 + 2*b^2*cos(x)^2 + 2*b^2*sin(3*x)^2 + 2*b^
2*sin(x)^2 + 4*(2*a^2 + 3*a*c + c^2)*cos(2*x)^2 + b*c*cos(x) + 4*(2*a^2 + 3
*a*c + c^2)*sin(2*x)^2 + 2*(4*a*b + 3*b*c)*sin(2*x)*sin(x) + (b*c*cos(3*x)
+ b*c*cos(x) + 2*(a*c + c^2)*cos(2*x))*cos(4*x) + (4*b^2*cos(x) + b*c + 2*(
4*a*b + 3*b*c)*cos(2*x))*cos(3*x) + 2*(a*c + c^2 + (4*a*b + 3*b*c)*cos(x))*
cos(2*x) + (b*c*sin(3*x) + b*c*sin(x) + 2*(a*c + c^2)*sin(2*x))*sin(4*x) +
2*(2*b^2*sin(x) + (4*a*b + 3*b*c)*sin(2*x))*sin(3*x))/(c^3*cos(4*x)^2 + 4*b
^2*c*cos(3*x)^2 + 4*b^2*c*cos(x)^2 + c^3*sin(4*x)^2 + 4*b^2*c*sin(3*x)^2 +
4*b^2*c*sin(x)^2 + 4*b*c^2*cos(x) + c^3 + 4*(4*a^2*c + 4*a*c^2 + c^3)*cos(2
*x)^2 + 4*(4*a^2*c + 4*a*c^2 + c^3)*sin(2*x)^2 + 8*(2*a*b*c + b*c^2)*sin(2*
x)*sin(x) + 2*(2*b*c^2*cos(3*x) + 2*b*c^2*cos(x) + c^3 + 2*(2*a*c^2 + c^3)*
cos(2*x))*cos(4*x) + 4*(2*b^2*c*cos(x) + b*c^2 + 2*(2*a*b*c + b*c^2)*cos(2*
x))*cos(3*x) + 4*(2*a*c^2 + c^3 + 2*(2*a*b*c + b*c^2)*cos(x))*cos(2*x) + 4*
(b*c^2*sin(3*x) + b*c^2*sin(x) + (2*a*c^2 + c^3)*sin(2*x))*sin(4*x) + 8*(b^
2*c*sin(x) + (2*a*b*c + b*c^2)*sin(2*x))*sin(3*x)), x) - x)/c
```

mupad [B] time = 13.28, size = 16390, normalized size = 63.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)^2/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] atan(((tan(x/2)*(57344*a^4*b - 57344*a*b^4 + 8192*a*c^4 + 8192*a^4*c + 5734
4*b*c^4 - 57344*b^4*c - 24576*a^5 + 24576*b^5 - 24576*c^5 + 49152*a^2*b^3 -
 49152*a^3*b^2 + 147456*a^2*c^3 + 147456*a^3*c^2 - 49152*b^2*c^3 + 49152*b^
3*c^2 + 245760*a*b^2*c^2 - 442368*a^2*b*c^2 + 245760*a^2*b^2*c - 163840*a*b
*c^3 - 32768*a*b^3*c - 163840*a^3*b*c) + (-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^
(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 -
 8*a*b^2*c^3)))^(1/2)*(32768*a*b^5 - 253952*a*c^5 - 24576*a^5*c + 57344*b*c
^5 + 57344*b^5*c - 24576*b^6 - 24576*c^6 + 16384*a^2*b^4 - 32768*a^3*b^3 +
8192*a^4*b^2 - 638976*a^2*c^4 - 638976*a^3*c^3 - 253952*a^4*c^2 + 24576*b^2
*c^4 - 114688*b^3*c^3 + 24576*b^4*c^2 + (tan(x/2)*(16384*a*b^6 - 81920*a*c^
6 + 49152*b*c^6 + 49152*b^6*c - 16384*b^7 - 16384*c^7 + 16384*a^2*b^5 - 163
84*a^3*b^4 + 229376*a^2*c^5 + 491520*a^3*c^4 + 49152*a^4*c^3 - 147456*a^5*c
^2 - 32768*b^2*c^5 - 32768*b^5*c^2 + 327680*a*b^3*c^3 - 425984*a*b^4*c^2 -
1015808*a^2*b*c^4 - 180224*a^2*b^4*c - 983040*a^3*b*c^3 - 65536*a^3*b^3*c +
 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 851968*a^2*b^2*c^3 + 131072*a^2*b^3*c^
2 + 393216*a^3*b^2*c^2 + 65536*a*b*c^5 + 98304*a*b^5*c) + (-(8*a*c^3 + b*(-
(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^
2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(24576*b^2*c^6 - 393216*a^2*c^6 - 58
9824*a^3*c^5 - 393216*a^4*c^4 - 98304*a^5*c^3 - 98304*a*c^7 - 49152*b^3*c^5
 + 49152*b^5*c^3 - 24576*b^6*c^2 + 98304*a*b^2*c^5 - 344064*a*b^3*c^4 + 983
04*a*b^4*c^3 + 49152*a*b^5*c^2 + 589824*a^2*b*c^5 + 589824*a^3*b*c^4 + 1966
08*a^4*b*c^3 + 147456*a^2*b^2*c^4 - 344064*a^2*b^3*c^3 + 98304*a^3*b^2*c^3
- 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 + 196608*a*b*c^6 - tan(x/2)*(-(8*a*
c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)
/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072*a^2*
c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 49
152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2
 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^
3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4
 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*
b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - 1146
88*a^4*b^2*c^3 - 196608*a*b*c^7)))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2)
+ b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b
^2*c^3)))^(1/2) + 147456*a*b^2*c^3 - 458752*a*b^3*c^2 + 802816*a^2*b*c^3 -
245760*a^2*b^3*c + 557056*a^3*b*c^2 - 16384*a^3*b^2*c + 98304*a^2*b^2*c^2 +
 425984*a*b*c^4 + 106496*a*b^4*c + 122880*a^4*b*c))*(-(8*a*c^3 + b*(-(4*a*c
 - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4
+ b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*1i + (tan(x/2)*(57344*a^4*b - 57344*a*b^4
+ 8192*a*c^4 + 8192*a^4*c + 57344*b*c^4 - 57344*b^4*c - 24576*a^5 + 24576*b
^5 - 24576*c^5 + 49152*a^2*b^3 - 49152*a^3*b^2 + 147456*a^2*c^3 + 147456*a^
3*c^2 - 49152*b^2*c^3 + 49152*b^3*c^2 + 245760*a*b^2*c^2 - 442368*a^2*b*c^2
```

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 + 245760*a^2*b^2*c - 163840*a*b*c^3 - 32768*a*b^3*c - 163840*a^3*b*c) - (-
(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b
^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(32768*a*b^5 - 253952
*a*c^5 - 24576*a^5*c + 57344*b*c^5 + 57344*b^5*c - 24576*b^6 - 24576*c^6 +
16384*a^2*b^4 - 32768*a^3*b^3 + 8192*a^4*b^2 - 638976*a^2*c^4 - 638976*a^3*
c^3 - 253952*a^4*c^2 + 24576*b^2*c^4 - 114688*b^3*c^3 + 24576*b^4*c^2 - (ta
n(x/2)*(16384*a*b^6 - 81920*a*c^6 + 49152*b*c^6 + 49152*b^6*c - 16384*b^7 -
 16384*c^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 229376*a^2*c^5 + 491520*a^3*c^
4 + 49152*a^4*c^3 - 147456*a^5*c^2 - 32768*b^2*c^5 - 32768*b^5*c^2 + 327680
*a*b^3*c^3 - 425984*a*b^4*c^2 - 1015808*a^2*b*c^4 - 180224*a^2*b^4*c - 9830
40*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 851968
*a^2*b^2*c^3 + 131072*a^2*b^3*c^2 + 393216*a^3*b^2*c^2 + 65536*a*b*c^5 + 98
304*a*b^5*c) - (-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 -
2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(245
76*b^2*c^6 - 393216*a^2*c^6 - 589824*a^3*c^5 - 393216*a^4*c^4 - 98304*a^5*c
^3 - 98304*a*c^7 - 49152*b^3*c^5 + 49152*b^5*c^3 - 24576*b^6*c^2 + 98304*a*
b^2*c^5 - 344064*a*b^3*c^4 + 98304*a*b^4*c^3 + 49152*a*b^5*c^2 + 589824*a^2
*b*c^5 + 589824*a^3*b*c^4 + 196608*a^4*b*c^3 + 147456*a^2*b^2*c^4 - 344064*
a^2*b^3*c^3 + 98304*a^3*b^2*c^3 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 + 1
96608*a*b*c^6 + tan(x/2)*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*
a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^
(1/2)*(65536*a*c^8 - 131072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196
608*a^5*c^4 - 16384*b^2*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4
 - 49152*b^6*c^3 + 16384*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 37
6832*a*b^4*c^4 - 114688*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 72
0896*a^3*b*c^5 - 65536*a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 +
 196608*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^
3*c^3 + 16384*a^3*b^4*c^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7)))*(-(8*a*c
^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/
(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2) + 147456*a*b^2*c^3 - 458752
*a*b^3*c^2 + 802816*a^2*b*c^3 - 245760*a^2*b^3*c + 557056*a^3*b*c^2 - 16384
*a^3*b^2*c + 98304*a^2*b^2*c^2 + 425984*a*b*c^4 + 106496*a*b^4*c + 122880*a
^4*b*c))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*
c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*1i)/((tan(
x/2)*(57344*a^4*b - 57344*a*b^4 + 8192*a*c^4 + 8192*a^4*c + 57344*b*c^4 - 5
7344*b^4*c - 24576*a^5 + 24576*b^5 - 24576*c^5 + 49152*a^2*b^3 - 49152*a^3*
b^2 + 147456*a^2*c^3 + 147456*a^3*c^2 - 49152*b^2*c^3 + 49152*b^3*c^2 + 245
760*a*b^2*c^2 - 442368*a^2*b*c^2 + 245760*a^2*b^2*c - 163840*a*b*c^3 - 3276
8*a*b^3*c - 163840*a^3*b*c) - (-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4
 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^
3)))^(1/2)*(32768*a*b^5 - 253952*a*c^5 - 24576*a^5*c + 57344*b*c^5 + 57344*
b^5*c - 24576*b^6 - 24576*c^6 + 16384*a^2*b^4 - 32768*a^3*b^3 + 8192*a^4*b^
2 - 638976*a^2*c^4 - 638976*a^3*c^3 - 253952*a^4*c^2 + 24576*b^2*c^4 - 1146
88*b^3*c^3 + 24576*b^4*c^2 - (tan(x/2)*(16384*a*b^6 - 81920*a*c^6 + 49152*b
*c^6 + 49152*b^6*c - 16384*b^7 - 16384*c^7 + 16384*a^2*b^5 - 16384*a^3*b^4
```

```
+ 229376*a^2*c^5 + 491520*a^3*c^4 + 49152*a^4*c^3 - 147456*a^5*c^2 - 32768*
b^2*c^5 - 32768*b^5*c^2 + 327680*a*b^3*c^3 - 425984*a*b^4*c^2 - 1015808*a^2
*b*c^4 - 180224*a^2*b^4*c - 983040*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*
b*c^2 + 98304*a^4*b^2*c + 851968*a^2*b^2*c^3 + 131072*a^2*b^3*c^2 + 393216*
a^3*b^2*c^2 + 65536*a*b*c^5 + 98304*a*b^5*c) - (-(8*a*c^3 + b*(-(4*a*c - b^
2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4
*c^2 - 8*a*b^2*c^3)))^(1/2)*(24576*b^2*c^6 - 393216*a^2*c^6 - 589824*a^3*c^
5 - 393216*a^4*c^4 - 98304*a^5*c^3 - 98304*a*c^7 - 49152*b^3*c^5 + 49152*b^
5*c^3 - 24576*b^6*c^2 + 98304*a*b^2*c^5 - 344064*a*b^3*c^4 + 98304*a*b^4*c^
3 + 49152*a*b^5*c^2 + 589824*a^2*b*c^5 + 589824*a^3*b*c^4 + 196608*a^4*b*c^
3 + 147456*a^2*b^2*c^4 - 344064*a^2*b^3*c^3 + 98304*a^3*b^2*c^3 - 49152*a^3
*b^3*c^2 + 24576*a^4*b^2*c^2 + 196608*a*b*c^6 + tan(x/2)*(-(8*a*c^3 + b*(-(
4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2
*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072*a^2*c^7 - 26214
4*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 49152*b^3*c^6
 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2 + 294912*a
*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^3 - 16384*a
*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4 - 655360*a
^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 5
57056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - 114688*a^4*b^2*
c^3 - 196608*a*b*c^7)))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a
^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(
1/2) + 147456*a*b^2*c^3 - 458752*a*b^3*c^2 + 802816*a^2*b*c^3 - 245760*a^2*
b^3*c + 557056*a^3*b*c^2 - 16384*a^3*b^2*c + 98304*a^2*b^2*c^2 + 425984*a*b
*c^4 + 106496*a*b^4*c + 122880*a^4*b*c))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^
(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 -
 8*a*b^2*c^3)))^(1/2) - (tan(x/2)*(57344*a^4*b - 57344*a*b^4 + 8192*a*c^4 +
 8192*a^4*c + 57344*b*c^4 - 57344*b^4*c - 24576*a^5 + 24576*b^5 - 24576*c^5
 + 49152*a^2*b^3 - 49152*a^3*b^2 + 147456*a^2*c^3 + 147456*a^3*c^2 - 49152*
b^2*c^3 + 49152*b^3*c^2 + 245760*a*b^2*c^2 - 442368*a^2*b*c^2 + 245760*a^2*
b^2*c - 163840*a*b*c^3 - 32768*a*b^3*c - 163840*a^3*b*c) + (-(8*a*c^3 + b*(
-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a
^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(32768*a*b^5 - 253952*a*c^5 - 24576
*a^5*c + 57344*b*c^5 + 57344*b^5*c - 24576*b^6 - 24576*c^6 + 16384*a^2*b^4
- 32768*a^3*b^3 + 8192*a^4*b^2 - 638976*a^2*c^4 - 638976*a^3*c^3 - 253952*a
^4*c^2 + 24576*b^2*c^4 - 114688*b^3*c^3 + 24576*b^4*c^2 + (tan(x/2)*(16384*
a*b^6 - 81920*a*c^6 + 49152*b*c^6 + 49152*b^6*c - 16384*b^7 - 16384*c^7 + 1
6384*a^2*b^5 - 16384*a^3*b^4 + 229376*a^2*c^5 + 491520*a^3*c^4 + 49152*a^4*
c^3 - 147456*a^5*c^2 - 32768*b^2*c^5 - 32768*b^5*c^2 + 327680*a*b^3*c^3 - 4
25984*a*b^4*c^2 - 1015808*a^2*b*c^4 - 180224*a^2*b^4*c - 983040*a^3*b*c^3 -
 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 851968*a^2*b^2*c^3 +
 131072*a^2*b^3*c^2 + 393216*a^3*b^2*c^2 + 65536*a*b*c^5 + 98304*a*b^5*c) +
 (-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*
a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(24576*b^2*c^6 - 3
93216*a^2*c^6 - 589824*a^3*c^5 - 393216*a^4*c^4 - 98304*a^5*c^3 - 98304*a*c
```

```
^7 - 49152*b^3*c^5 + 49152*b^5*c^3 - 24576*b^6*c^2 + 98304*a*b^2*c^5 - 3440
64*a*b^3*c^4 + 98304*a*b^4*c^3 + 49152*a*b^5*c^2 + 589824*a^2*b*c^5 + 58982
4*a^3*b*c^4 + 196608*a^4*b*c^3 + 147456*a^2*b^2*c^4 - 344064*a^2*b^3*c^3 +
98304*a^3*b^2*c^3 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 + 196608*a*b*c^6
- tan(x/2)*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^
2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(65536*a
*c^8 - 131072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 -
16384*b^2*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c
^3 + 16384*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4
 - 114688*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5
 - 65536*a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^
4*c^3 - 16384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*
a^3*b^4*c^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7)))*(-(8*a*c^3 + b*(-(4*a*
c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4
 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2) + 147456*a*b^2*c^3 - 458752*a*b^3*c^2 + 8
02816*a^2*b*c^3 - 245760*a^2*b^3*c + 557056*a^3*b*c^2 - 16384*a^3*b^2*c + 9
8304*a^2*b^2*c^2 + 425984*a*b*c^4 + 106496*a*b^4*c + 122880*a^4*b*c))*(-(8*
a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*
c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2) + 131072*a*b^3 - 131072*
a^3*b + 262144*a*c^3 + 262144*a^3*c - 131072*b*c^3 + 131072*b^3*c + 65536*a
^4 - 65536*b^4 + 65536*c^4 + 393216*a^2*c^2 - 393216*a*b*c^2 - 393216*a^2*b
*c))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2
- 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*2i + atan(((ta
n(x/2)*(57344*a^4*b - 57344*a*b^4 + 8192*a*c^4 + 8192*a^4*c + 57344*b*c^4 -
 57344*b^4*c - 24576*a^5 + 24576*b^5 - 24576*c^5 + 49152*a^2*b^3 - 49152*a^
3*b^2 + 147456*a^2*c^3 + 147456*a^3*c^2 - 49152*b^2*c^3 + 49152*b^3*c^2 + 2
45760*a*b^2*c^2 - 442368*a^2*b*c^2 + 245760*a^2*b^2*c - 163840*a*b*c^3 - 32
768*a*b^3*c - 163840*a^3*b*c) + (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b
^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*
c^3)))^(1/2)*(32768*a*b^5 - 253952*a*c^5 - 24576*a^5*c + 57344*b*c^5 + 5734
4*b^5*c - 24576*b^6 - 24576*c^6 + 16384*a^2*b^4 - 32768*a^3*b^3 + 8192*a^4*
b^2 - 638976*a^2*c^4 - 638976*a^3*c^3 - 253952*a^4*c^2 + 24576*b^2*c^4 - 11
4688*b^3*c^3 + 24576*b^4*c^2 + (tan(x/2)*(16384*a*b^6 - 81920*a*c^6 + 49152
*b*c^6 + 49152*b^6*c - 16384*b^7 - 16384*c^7 + 16384*a^2*b^5 - 16384*a^3*b^
4 + 229376*a^2*c^5 + 491520*a^3*c^4 + 49152*a^4*c^3 - 147456*a^5*c^2 - 3276
8*b^2*c^5 - 32768*b^5*c^2 + 327680*a*b^3*c^3 - 425984*a*b^4*c^2 - 1015808*a
^2*b*c^4 - 180224*a^2*b^4*c - 983040*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^
4*b*c^2 + 98304*a^4*b^2*c + 851968*a^2*b^2*c^3 + 131072*a^2*b^3*c^2 + 39321
6*a^3*b^2*c^2 + 65536*a*b*c^5 + 98304*a*b^5*c) + (-(8*a*c^3 - b*(-(4*a*c -
b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b
^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(24576*b^2*c^6 - 393216*a^2*c^6 - 589824*a^3*
c^5 - 393216*a^4*c^4 - 98304*a^5*c^3 - 98304*a*c^7 - 49152*b^3*c^5 + 49152*
b^5*c^3 - 24576*b^6*c^2 + 98304*a*b^2*c^5 - 344064*a*b^3*c^4 + 98304*a*b^4*
c^3 + 49152*a*b^5*c^2 + 589824*a^2*b*c^5 + 589824*a^3*b*c^4 + 196608*a^4*b*
c^3 + 147456*a^2*b^2*c^4 - 344064*a^2*b^3*c^3 + 98304*a^3*b^2*c^3 - 49152*a
```

```
^3*b^3*c^2 + 24576*a^4*b^2*c^2 + 196608*a*b*c^6 - tan(x/2)*(-(8*a*c^3 - b*(
-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a
^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072*a^2*c^7 - 262
144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 49152*b^3*c
^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2 + 294912
*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^3 - 16384
*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4 - 655360
*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 -
 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - 114688*a^4*b^
2*c^3 - 196608*a*b*c^7)))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8
*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))
^(1/2) + 147456*a*b^2*c^3 - 458752*a*b^3*c^2 + 802816*a^2*b*c^3 - 245760*a^
2*b^3*c + 557056*a^3*b*c^2 - 16384*a^3*b^2*c + 98304*a^2*b^2*c^2 + 425984*a
*b*c^4 + 106496*a*b^4*c + 122880*a^4*b*c))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3
)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2
 - 8*a*b^2*c^3)))^(1/2)*1i + (tan(x/2)*(57344*a^4*b - 57344*a*b^4 + 8192*a*
c^4 + 8192*a^4*c + 57344*b*c^4 - 57344*b^4*c - 24576*a^5 + 24576*b^5 - 2457
6*c^5 + 49152*a^2*b^3 - 49152*a^3*b^2 + 147456*a^2*c^3 + 147456*a^3*c^2 - 4
9152*b^2*c^3 + 49152*b^3*c^2 + 245760*a*b^2*c^2 - 442368*a^2*b*c^2 + 245760
*a^2*b^2*c - 163840*a*b*c^3 - 32768*a*b^3*c - 163840*a^3*b*c) - (-(8*a*c^3
 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*
(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(32768*a*b^5 - 253952*a*c^5 -
24576*a^5*c + 57344*b*c^5 + 57344*b^5*c - 24576*b^6 - 24576*c^6 + 16384*a^2
*b^4 - 32768*a^3*b^3 + 8192*a^4*b^2 - 638976*a^2*c^4 - 638976*a^3*c^3 - 253
952*a^4*c^2 + 24576*b^2*c^4 - 114688*b^3*c^3 + 24576*b^4*c^2 - (tan(x/2)*(1
6384*a*b^6 - 81920*a*c^6 + 49152*b*c^6 + 49152*b^6*c - 16384*b^7 - 16384*c^
7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 229376*a^2*c^5 + 491520*a^3*c^4 + 49152
*a^4*c^3 - 147456*a^5*c^2 - 32768*b^2*c^5 - 32768*b^5*c^2 + 327680*a*b^3*c^
3 - 425984*a*b^4*c^2 - 1015808*a^2*b*c^4 - 180224*a^2*b^4*c - 983040*a^3*b*
c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 851968*a^2*b^2*
c^3 + 131072*a^2*b^3*c^2 + 393216*a^3*b^2*c^2 + 65536*a*b*c^5 + 98304*a*b^5
*c) - (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2
 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(24576*b^2*c^
6 - 393216*a^2*c^6 - 589824*a^3*c^5 - 393216*a^4*c^4 - 98304*a^5*c^3 - 9830
4*a*c^7 - 49152*b^3*c^5 + 49152*b^5*c^3 - 24576*b^6*c^2 + 98304*a*b^2*c^5 -
 344064*a*b^3*c^4 + 98304*a*b^4*c^3 + 49152*a*b^5*c^2 + 589824*a^2*b*c^5 +
589824*a^3*b*c^4 + 196608*a^4*b*c^3 + 147456*a^2*b^2*c^4 - 344064*a^2*b^3*c
^3 + 98304*a^3*b^2*c^3 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 + 196608*a*b
*c^6 + tan(x/2)*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 -
 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(65
536*a*c^8 - 131072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c
^4 - 16384*b^2*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*
b^6*c^3 + 16384*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^
4*c^4 - 114688*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*
b*c^5 - 65536*a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a
```

^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 1
6384*a^3*b^4*c^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7)))*(-(8*a*c^3 - b*(-
(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^
2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2) + 147456*a*b^2*c^3 - 458752*a*b^3*c^
2 + 802816*a^2*b*c^3 - 245760*a^2*b^3*c + 557056*a^3*b*c^2 - 16384*a^3*b^2*
c + 98304*a^2*b^2*c^2 + 425984*a*b*c^4 + 106496*a*b^4*c + 122880*a^4*b*c))*
(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a
*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*1i)/((tan(x/2)*(573
44*a^4*b - 57344*a*b^4 + 8192*a*c^4 + 8192*a^4*c + 57344*b*c^4 - 57344*b^4*
c - 24576*a^5 + 24576*b^5 - 24576*c^5 + 49152*a^2*b^3 - 49152*a^3*b^2 + 147
456*a^2*c^3 + 147456*a^3*c^2 - 49152*b^2*c^3 + 49152*b^3*c^2 + 245760*a*b^2
*c^2 - 442368*a^2*b*c^2 + 245760*a^2*b^2*c - 163840*a*b*c^3 - 32768*a*b^3*c
 - 163840*a^3*b*c) - (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*
c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2
)*(32768*a*b^5 - 253952*a*c^5 - 24576*a^5*c + 57344*b*c^5 + 57344*b^5*c - 2
4576*b^6 - 24576*c^6 + 16384*a^2*b^4 - 32768*a^3*b^3 + 8192*a^4*b^2 - 63897
6*a^2*c^4 - 638976*a^3*c^3 - 253952*a^4*c^2 + 24576*b^2*c^4 - 114688*b^3*c^
3 + 24576*b^4*c^2 - (tan(x/2)*(16384*a*b^6 - 81920*a*c^6 + 49152*b*c^6 + 49
152*b^6*c - 16384*b^7 - 16384*c^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 229376*
a^2*c^5 + 491520*a^3*c^4 + 49152*a^4*c^3 - 147456*a^5*c^2 - 32768*b^2*c^5 -
 32768*b^5*c^2 + 327680*a*b^3*c^3 - 425984*a*b^4*c^2 - 1015808*a^2*b*c^4 -
180224*a^2*b^4*c - 983040*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 9
8304*a^4*b^2*c + 851968*a^2*b^2*c^3 + 131072*a^2*b^3*c^2 + 393216*a^3*b^2*c
^2 + 65536*a*b*c^5 + 98304*a*b^5*c) - (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/
2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*
a*b^2*c^3)))^(1/2)*(24576*b^2*c^6 - 393216*a^2*c^6 - 589824*a^3*c^5 - 39321
6*a^4*c^4 - 98304*a^5*c^3 - 98304*a*c^7 - 49152*b^3*c^5 + 49152*b^5*c^3 - 2
4576*b^6*c^2 + 98304*a*b^2*c^5 - 344064*a*b^3*c^4 + 98304*a*b^4*c^3 + 49152
*a*b^5*c^2 + 589824*a^2*b*c^5 + 589824*a^3*b*c^4 + 196608*a^4*b*c^3 + 14745
6*a^2*b^2*c^4 - 344064*a^2*b^3*c^3 + 98304*a^3*b^2*c^3 - 49152*a^3*b^3*c^2
+ 24576*a^4*b^2*c^2 + 196608*a*b*c^6 + tan(x/2)*(-(8*a*c^3 - b*(-(4*a*c - b
^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^
4*c^2 - 8*a*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072*a^2*c^7 - 262144*a^3*c^6
 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 49152*b^3*c^6 - 65536*
b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2 + 294912*a*b^2*c^6
- 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^3 - 16384*a*b^6*c^2
+ 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4 - 655360*a^2*b^2*c^
5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 557056*a^3
*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - 114688*a^4*b^2*c^3 - 196
608*a*b*c^7)))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 -
2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2) + 14
7456*a*b^2*c^3 - 458752*a*b^3*c^2 + 802816*a^2*b*c^3 - 245760*a^2*b^3*c + 5
57056*a^3*b*c^2 - 16384*a^3*b^2*c + 98304*a^2*b^2*c^2 + 425984*a*b*c^4 + 10
6496*a*b^4*c + 122880*a^4*b*c))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b
^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*

c^3)))^(1/2) - (tan(x/2)*(57344*a^4*b - 57344*a*b^4 + 8192*a*c^4 + 8192*a^4
*c + 57344*b*c^4 - 57344*b^4*c - 24576*a^5 + 24576*b^5 - 24576*c^5 + 49152*
a^2*b^3 - 49152*a^3*b^2 + 147456*a^2*c^3 + 147456*a^3*c^2 - 49152*b^2*c^3 +
49152*b^3*c^2 + 245760*a*b^2*c^2 - 442368*a^2*b*c^2 + 245760*a^2*b^2*c - 1
63840*a*b*c^3 - 32768*a*b^3*c - 163840*a^3*b*c) + (-(8*a*c^3 - b*(-(4*a*c -
b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 +
b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(32768*a*b^5 - 253952*a*c^5 - 24576*a^5*c +
57344*b*c^5 + 57344*b^5*c - 24576*b^6 - 24576*c^6 + 16384*a^2*b^4 - 32768*a
^3*b^3 + 8192*a^4*b^2 - 638976*a^2*c^4 - 638976*a^3*c^3 - 253952*a^4*c^2 +
24576*b^2*c^4 - 114688*b^3*c^3 + 24576*b^4*c^2 + (tan(x/2)*(16384*a*b^6 - 8
1920*a*c^6 + 49152*b*c^6 + 49152*b^6*c - 16384*b^7 - 16384*c^7 + 16384*a^2*
b^5 - 16384*a^3*b^4 + 229376*a^2*c^5 + 491520*a^3*c^4 + 49152*a^4*c^3 - 147
456*a^5*c^2 - 32768*b^2*c^5 - 32768*b^5*c^2 + 327680*a*b^3*c^3 - 425984*a*b
^4*c^2 - 1015808*a^2*b*c^4 - 180224*a^2*b^4*c - 983040*a^3*b*c^3 - 65536*a^
3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 851968*a^2*b^2*c^3 + 131072*a
^2*b^3*c^2 + 393216*a^3*b^2*c^2 + 65536*a*b*c^5 + 98304*a*b^5*c) + (-(8*a*c
^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/
(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(24576*b^2*c^6 - 393216*a^2
*c^6 - 589824*a^3*c^5 - 393216*a^4*c^4 - 98304*a^5*c^3 - 98304*a*c^7 - 4915
2*b^3*c^5 + 49152*b^5*c^3 - 24576*b^6*c^2 + 98304*a*b^2*c^5 - 344064*a*b^3*
c^4 + 98304*a*b^4*c^3 + 49152*a*b^5*c^2 + 589824*a^2*b*c^5 + 589824*a^3*b*c
^4 + 196608*a^4*b*c^3 + 147456*a^2*b^2*c^4 - 344064*a^2*b^3*c^3 + 98304*a^3
*b^2*c^3 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 + 196608*a*b*c^6 - tan(x/2
)*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6
*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*(65536*a*c^8 - 13
1072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2
*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 1638
4*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688
*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*
a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 1
6384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c
^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^
3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16*a^2*c^4 + b^4*c^
2 - 8*a*b^2*c^3)))^(1/2) + 147456*a*b^2*c^3 - 458752*a*b^3*c^2 + 802816*a^2
*b*c^3 - 245760*a^2*b^3*c + 557056*a^3*b*c^2 - 16384*a^3*b^2*c + 98304*a^2*
b^2*c^2 + 425984*a*b*c^4 + 106496*a*b^4*c + 122880*a^4*b*c))*(-(8*a*c^3 - b
*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(16
*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2) + 131072*a*b^3 - 131072*a^3*b + 2
62144*a*c^3 + 262144*a^3*c - 131072*b*c^3 + 131072*b^3*c + 65536*a^4 - 6553
6*b^4 + 65536*c^4 + 393216*a^2*c^2 - 393216*a*b*c^2 - 393216*a^2*b*c))*(-(8
*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2
c)/(2(16*a^2*c^4 + b^4*c^2 - 8*a*b^2*c^3)))^(1/2)*2i - (2*atan((344064*a^
4*tan(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3 - 98304*a*b^3 - 1638
4*b*c^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a^2*b^2 - 98304*a^2*c^
2 + (147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c - (147456*a^4*b)/c - (

32768*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^2)/c + (32768*a^2*b^4
)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a
*b^2*c + 32768*a^2*b*c) - (16384*b^4*tan(x/2))/(163840*a^3*c - 196608*a^3*b
 - 49152*a*c^3 - 98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4 + 16384
*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/c + (16
384*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^3)/c -
(229376*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4
*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c) + (16384*c^4*tan
(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3 - 98304*a*b^3 - 16384*b*c
^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2 + (
147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c - (147456*a^4*b)/c - (32768
*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^2)/c + (32768*a^2*b^4)/c^2
 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b^2*
c + 32768*a^2*b*c) + (147456*a^5*tan(x/2))/(16384*a*b^4 - 147456*a^4*b - 49
152*a*c^4 + 344064*a^4*c - 16384*b*c^4 - 16384*b^4*c + 147456*a^5 + 16384*b
^5 + 16384*c^5 + 196608*a^2*b^3 - 229376*a^3*b^2 - 98304*a^2*c^3 + 163840*a
^3*c^2 + 98304*a*b^2*c^2 + 32768*a^2*b*c^2 - 98304*a^2*b^2*c - (32768*a*b^5
)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 65536*a*b
*c^3 - 98304*a*b^3*c - 196608*a^3*b*c) + (16384*b^5*tan(x/2))/(16384*a*b^4
- 147456*a^4*b - 49152*a*c^4 + 344064*a^4*c - 16384*b*c^4 - 16384*b^4*c + 1
47456*a^5 + 16384*b^5 + 16384*c^5 + 196608*a^2*b^3 - 229376*a^3*b^2 - 98304
*a^2*c^3 + 163840*a^3*c^2 + 98304*a*b^2*c^2 + 32768*a^2*b*c^2 - 98304*a^2*b
^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4
*b^2)/c + 65536*a*b*c^3 - 98304*a*b^3*c - 196608*a^3*b*c) - (98304*a^2*b^2*
tan(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3 - 98304*a*b^3 - 16384*
b*c^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2
+ (147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c - (147456*a^4*b)/c - (32
768*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^2)/c + (32768*a^2*b^4)/
c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b
^2*c + 32768*a^2*b*c) - (98304*a^2*c^2*tan(x/2))/(163840*a^3*c - 196608*a^3
*b - 49152*a*c^3 - 98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4 + 163
84*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/c + (
16384*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^3)/c
- (229376*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a
^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c) + (16384*a*b^4
*tan(x/2))/(16384*a*b^4 - 147456*a^4*b - 49152*a*c^4 + 344064*a^4*c - 16384
*b*c^4 - 16384*b^4*c + 147456*a^5 + 16384*b^5 + 16384*c^5 + 196608*a^2*b^3
- 229376*a^3*b^2 - 98304*a^2*c^3 + 163840*a^3*c^2 + 98304*a*b^2*c^2 + 32768
*a^2*b*c^2 - 98304*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768
*a^3*b^3)/c - (32768*a^4*b^2)/c + 65536*a*b*c^3 - 98304*a*b^3*c - 196608*a^
3*b*c) - (147456*a^4*b*tan(x/2))/(16384*a*b^4 - 147456*a^4*b - 49152*a*c^4
+ 344064*a^4*c - 16384*b*c^4 - 16384*b^4*c + 147456*a^5 + 16384*b^5 + 16384
*c^5 + 196608*a^2*b^3 - 229376*a^3*b^2 - 98304*a^2*c^3 + 163840*a^3*c^2 + 9
8304*a*b^2*c^2 + 32768*a^2*b*c^2 - 98304*a^2*b^2*c - (32768*a*b^5)/c + (327
68*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 65536*a*b*c^3 - 983

```
04*a*b^3*c - 196608*a^3*b*c) - (32768*a*b^5*tan(x/2))/(147456*a^5*c - 49152
*a*c^5 - 32768*a*b^5 - 16384*b*c^5 + 16384*b^5*c + 16384*c^6 + 32768*a^2*b^
4 + 32768*a^3*b^3 - 32768*a^4*b^2 - 98304*a^2*c^4 + 163840*a^3*c^3 + 344064
*a^4*c^2 - 16384*b^4*c^2 + 98304*a*b^2*c^3 - 98304*a*b^3*c^2 + 32768*a^2*b*
c^3 + 196608*a^2*b^3*c - 196608*a^3*b*c^2 - 229376*a^3*b^2*c - 98304*a^2*b^
2*c^2 + 65536*a*b*c^4 + 16384*a*b^4*c - 147456*a^4*b*c) + (196608*a^2*b^3*t
an(x/2))/(16384*a*b^4 - 147456*a^4*b - 49152*a*c^4 + 344064*a^4*c - 16384*b
*c^4 - 16384*b^4*c + 147456*a^5 + 16384*b^5 + 16384*c^5 + 196608*a^2*b^3 -
229376*a^3*b^2 - 98304*a^2*c^3 + 163840*a^3*c^2 + 98304*a*b^2*c^2 + 32768*a
^2*b*c^2 - 98304*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a
^3*b^3)/c - (32768*a^4*b^2)/c + 65536*a*b*c^3 - 98304*a*b^3*c - 196608*a^3*
b*c) - (229376*a^3*b^2*tan(x/2))/(16384*a*b^4 - 147456*a^4*b - 49152*a*c^4
+ 344064*a^4*c - 16384*b*c^4 - 16384*b^4*c + 147456*a^5 + 16384*b^5 + 16384
*c^5 + 196608*a^2*b^3 - 229376*a^3*b^2 - 98304*a^2*c^3 + 163840*a^3*c^2 + 9
8304*a*b^2*c^2 + 32768*a^2*b*c^2 - 98304*a^2*b^2*c - (32768*a*b^5)/c + (327
68*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 65536*a*b*c^3 - 983
04*a*b^3*c - 196608*a^3*b*c) - (98304*a*b^3*tan(x/2))/(163840*a^3*c - 19660
8*a^3*b - 49152*a*c^3 - 98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4
+ 16384*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/
c + (16384*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^
3)/c - (229376*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32
768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c) - (196608
*a^3*b*tan(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3 - 98304*a*b^3 -
 16384*b*c^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a^2*b^2 - 98304*a
^2*c^2 + (147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c - (147456*a^4*b)/
c - (32768*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^2)/c + (32768*a^
2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98
304*a*b^2*c + 32768*a^2*b*c) - (49152*a*c^3*tan(x/2))/(163840*a^3*c - 19660
8*a^3*b - 49152*a*c^3 - 98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4
+ 16384*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/
c + (16384*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^
3)/c - (229376*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32
768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c) + (163840
*a^3*c*tan(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3 - 98304*a*b^3 -
 16384*b*c^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a^2*b^2 - 98304*a
^2*c^2 + (147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c - (147456*a^4*b)/
c - (32768*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^2)/c + (32768*a^
2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98
304*a*b^2*c + 32768*a^2*b*c) - (16384*b*c^3*tan(x/2))/(163840*a^3*c - 19660
8*a^3*b - 49152*a*c^3 - 98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4
+ 16384*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/
c + (16384*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^
3)/c - (229376*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32
768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c) + (32768*
a^2*b^4*tan(x/2))/(147456*a^5*c - 49152*a*c^5 - 32768*a*b^5 - 16384*b*c^5 +
```

```
 16384*b^5*c + 16384*c^6 + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 -
98304*a^2*c^4 + 163840*a^3*c^3 + 344064*a^4*c^2 - 16384*b^4*c^2 + 98304*a*b
^2*c^3 - 98304*a*b^3*c^2 + 32768*a^2*b*c^3 + 196608*a^2*b^3*c - 196608*a^3*
b*c^2 - 229376*a^3*b^2*c - 98304*a^2*b^2*c^2 + 65536*a*b*c^4 + 16384*a*b^4*
c - 147456*a^4*b*c) + (32768*a^3*b^3*tan(x/2))/(147456*a^5*c - 49152*a*c^5
- 32768*a*b^5 - 16384*b*c^5 + 16384*b^5*c + 16384*c^6 + 32768*a^2*b^4 + 327
68*a^3*b^3 - 32768*a^4*b^2 - 98304*a^2*c^4 + 163840*a^3*c^3 + 344064*a^4*c^
2 - 16384*b^4*c^2 + 98304*a*b^2*c^3 - 98304*a*b^3*c^2 + 32768*a^2*b*c^3 + 1
96608*a^2*b^3*c - 196608*a^3*b*c^2 - 229376*a^3*b^2*c - 98304*a^2*b^2*c^2 +
 65536*a*b*c^4 + 16384*a*b^4*c - 147456*a^4*b*c) - (32768*a^4*b^2*tan(x/2))
/(147456*a^5*c - 49152*a*c^5 - 32768*a*b^5 - 16384*b*c^5 + 16384*b^5*c + 16
384*c^6 + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 - 98304*a^2*c^4 + 1
63840*a^3*c^3 + 344064*a^4*c^2 - 16384*b^4*c^2 + 98304*a*b^2*c^3 - 98304*a*
b^3*c^2 + 32768*a^2*b*c^3 + 196608*a^2*b^3*c - 196608*a^3*b*c^2 - 229376*a^
3*b^2*c - 98304*a^2*b^2*c^2 + 65536*a*b*c^4 + 16384*a*b^4*c - 147456*a^4*b*
c) + (65536*a*b*c^2*tan(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3 -
98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a^2*
b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c - (1
47456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^2)/
c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536
*a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c) + (98304*a*b^2*c*tan(x/2))/(16384
0*a^3*c - 196608*a^3*b - 49152*a*c^3 - 98304*a*b^3 - 16384*b*c^3 + 344064*a
^4 - 16384*b^4 + 16384*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c
 + (16384*b^5)/c + (16384*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 +
 (196608*a^2*b^3)/c - (229376*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3
*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2
*b*c) + (32768*a^2*b*c*tan(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3
 - 98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a
^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c -
 (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^
2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65
536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c)))/c
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)**2/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Timed out
```

3.8 $\int \frac{\csc^2(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=326

$$-\frac{2bc\left(\frac{b^2-2c(a+c)}{b\sqrt{b^2-4ac}}+1\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{(a-b+c)(a+b+c)\sqrt{-\sqrt{b^2-4ac}+b-2c}\,\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{2bc\left(1-\frac{b^2-2c(a+c)}{b\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\cdots}{\sqrt{\cdots}}\right)}{(a-b+c)(a+b+c)\sqrt{\sqrt{b^2-4ac}+b-\cdots}}$$

```
[Out] -1/2*sin(x)/(a+b+c)/(1-cos(x))+1/2*sin(x)/(a-b+c)/(1+cos(x))-2*b*c*arctan((
b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)
)*(1+(b^2-2*c*(a+c))/b/(-4*a*c+b^2)^(1/2))/(a-b+c)/(a+b+c)/(b-2*c-(-4*a*c+b
^2)^(1/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)-2*b*c*arctan((b-2*c+(-4*a
*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2))*(1+(-b^2+
2*c*(a+c))/b/(-4*a*c+b^2)^(1/2))/(a-b+c)/(a+b+c)/(b-2*c+(-4*a*c+b^2)^(1/2))
^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2)
```

Rubi [A] time = 3.34, antiderivative size = 326, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {3267, 2648, 3293, 2659, 205}

$$-\frac{2bc\left(\frac{b^2-2c(a+c)}{b\sqrt{b^2-4ac}}+1\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{(a-b+c)(a+b+c)\sqrt{-\sqrt{b^2-4ac}+b-2c}\,\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{2bc\left(1-\frac{b^2-2c(a+c)}{b\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\cdots}{\sqrt{\cdots}}\right)}{(a-b+c)(a+b+c)\sqrt{\sqrt{b^2-4ac}+b-\cdots}}$$

Antiderivative was successfully verified.

```
[In] Int[Csc[x]^2/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (-2*b*c*(1 + (b^2 - 2*c*(a + c))/(b*Sqrt[b^2 - 4*a*c]))*ArcTan[(Sqrt[b - 2*
c - Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/((a -
b + c)*(a + b + c)*Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c - Sqrt[b^
2 - 4*a*c]]) - (2*b*c*(1 - (b^2 - 2*c*(a + c))/(b*Sqrt[b^2 - 4*a*c]))*ArcTa
n[(Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2 - 4*
a*c]]])/((a - b + c)*(a + b + c)*Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Sqrt[b +
 2*c + Sqrt[b^2 - 4*a*c]]) - Sin[x]/(2*(a + b + c)*(1 - Cos[x])) + Sin[x]/(
2*(a - b + c)*(1 + Cos[x]))
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2648

```
Int[((a_) + (b_.)*sin[(c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> -Simp[Cos[c +
 d*x]/(d*(b + a*Sin[c + d*x])), x] /; FreeQ[{a, b, c, d}, x] && EqQ[a^2 - b
^2, 0]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3267

```
Int[((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b_.) + cos[(d_.) + (e_.)*(x_)]^
(n2_.)*(c_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol] :> Int[ExpandT
rig[(1 - cos[d + e*x]^2)^(m/2)*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n)
)^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && IntegerQ[m/2] &
& NeQ[b^2 - 4*a*c, 0] && IntegersQ[n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rubi steps

$$\int \frac{\csc^2(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int\left(-\frac{1}{2(a+b+c)(-1+\cos(x))}+\frac{1}{2(a-b+c)(1+\cos(x))}+\frac{-b^2\left(1\right.}{(a-b+c)(a+b}\right.$$

$$= \frac{\int \frac{1}{1+\cos(x)}\,dx}{2(a-b+c)} - \frac{\int \frac{1}{-1+\cos(x)}\,dx}{2(a+b+c)} + \frac{\int \frac{-b^2\left(1-\frac{c(a+c)}{b^2}\right)-bc\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{(a-b+c)(a+b+c)}$$

$$= -\frac{\sin(x)}{2(a+b+c)(1-\cos(x))}+\frac{\sin(x)}{2(a-b+c)(1+\cos(x))}-\frac{\left(c\left(b+\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\right)\int \frac{}{b-}}{(a-b+c)(a}$$

$$= -\frac{\sin(x)}{2(a+b+c)(1-\cos(x))}+\frac{\sin(x)}{2(a-b+c)(1+\cos(x))}-\frac{\left(2c\left(b+\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\right)\mathrm{Su}}{}$$

$$= -\frac{2c\left(b+\frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{(a-b+c)(a+b+c)\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}} - \frac{}{(a-b+}$$

Mathematica [A] time = 0.97, size = 335, normalized size = 1.03

$$\frac{\sqrt{2}\,c\left(b\sqrt{b^2-4ac}+2c(a+c)-b^2\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\left(a^2+2ac-b^2+c^2\right)\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}}-\frac{\sqrt{2}\,c\left(b\sqrt{b^2-4ac}-2c(a+c)+b^2\right)\tanh}{\sqrt{b^2-4ac}\left(a^2+2ac-b^2+c^2\right)\sqrt{b\sqrt{b^2}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Csc[x]^2/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (Sqrt[2]*c*(-b^2 + 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c])*ArcTanh[((b - 2*c + S
qrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) - 2*b*Sqrt[b^2 - 4*a*
c]]])/(Sqrt[b^2 - 4*a*c]*(a^2 - b^2 + 2*a*c + c^2)*Sqrt[-b^2 + 2*c*(a + c)
- b*Sqrt[b^2 - 4*a*c]]) - (Sqrt[2]*c*(b^2 - 2*c*(a + c) + b*Sqrt[b^2 - 4*a*
c])*ArcTanh[((-b + 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a
+ c) + 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*(a^2 - b^2 + 2*a*c + c^2
)*Sqrt[-b^2 + 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c]]) - Cot[x/2]/(2*(a + b + c)
) + Tan[x/2]/(2*(a - b + c))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.15, size = 2816, normalized size = 8.64

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(csc(x)^2/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 6/(a+b+c)/(a-b+c)^2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))
^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*
c^2*b-2/(a+b+c)/(a-b+c)^2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a
-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(
1/2))*c*b^2-6/(a+b+c)/(a-b+c)^2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a
+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a
-b+c))^(1/2))*c^2*b+3/(a+b+c)/(a-b+c)^2/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(
1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c
)*(a-b+c))^(1/2))*a^2*b*c+2/(a+b+c)/(a-b+c)^2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)
^(1/2)-a+c)*(a-b+c))^(1/2))*c*b^2-3/(a+b+c)/(a-b+c)^2/(-4*a*c+b^2)^(1/2)/((
(-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2*b*c-1/2/(a+b+c)/tan(1/2*x)-3/(a+b+c)/
(a-b+c)^2*b/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arc
tanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^3-2/(a
+b+c)/(a-b+c)^2/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)
*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c*b^3-
4/(a+b+c)/(a-b+c)^2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))
^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*
c^3+3/(a+b+c)/(a-b+c)^2*b/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b
+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/
2))*c^3+1/(a+b+c)/(a-b+c)^2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*
(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c
```

```
))^(1/2))*b^3+4/(a+b+c)/(a-b+c)^2*a/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)
-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*
(a-b+c))^(1/2))*c^3-2/(a+b+c)/(a-b+c)^2/(-4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(
1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c
)*(a-b+c))^(1/2))*a^2*c^2+2/(a+b+c)/(a-b+c)^2*a/(((-4*a*c+b^2)^(1/2)+a-c)*(
a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^
(1/2))*c^2-2/(a+b+c)/(a-b+c)^2/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arc
tanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*b^2+1/
(a+b+c)/(a-b+c)^2/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^3+1/(a+b+c)/(a-b+c)
^2/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4
*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^3-1/(a+b+c)/(a-b+c)^2*a/(-4*a*c+b^2)
^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(
((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3+2/(a+b+c)/(a-b+c)^2/(-4*a*c+b^
2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*
x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2*c^2+2/(a+b+c)/(a-b+c)^2/(-
4*a*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*
tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*b^3+1/2/(a-b+c)*tan(
1/2*x)+1/(a+b+c)/(a-b+c)^2/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh
((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^3+1/(a+b+c
)/(a-b+c)^2/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2
*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3+1/(a+b+c)/(a-b+c)^2/(-4*a
*c+b^2)^(1/2)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^4+2/(a+b+c)/(a-b+c)^2*a/(
((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a
*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2-1/(a+b+c)/(a-b+c)^2/(-4*a*c+b^2)^(1/
2)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((
-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^4-2/(a+b+c)/(a-b+c)^2/(((-4*a*c+b^
2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)
+a-c)*(a-b+c))^(1/2))*c*b^2+2/(a+b+c)/(a-b+c)^2/(-4*a*c+b^2)^(1/2)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)
^(1/2)-a+c)*(a-b+c))^(1/2))*c^4-2/(a+b+c)/(a-b+c)^2/(-4*a*c+b^2)^(1/2)/(((-
4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^
2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^4+1/(a+b+c)/(a-b+c)^2/(((-4*a*c+b^2)^(1/2)-
a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(
a-b+c))^(1/2))*c*a^2-1/(a+b+c)/(a-b+c)^2*a/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c
))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/
2))*b^2-1/(a+b+c)/(a-b+c)^2*a/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arct
an((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2+1/(a+b+
c)/(a-b+c)^2/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/
2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c*a^2
```

maxima [F]   time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] -(2*b*cos(2*x)*sin(x) + ((a^2 - b^2 + 2*a*c + c^2)*cos(2*x)^2 + (a^2 - b^2
+ 2*a*c + c^2)*sin(2*x)^2 + a^2 - b^2 + 2*a*c + c^2 - 2*(a^2 - b^2 + 2*a*c
+ c^2)*cos(2*x))*integrate(2*(2*b^2*c*cos(3*x)^2 + 2*b^2*c*cos(x)^2 + 2*b^2
*c*sin(3*x)^2 + 2*b^2*c*sin(x)^2 + b*c^2*cos(x) + 4*(2*a*b^2 - 3*a*c^2 - c^
3 - (2*a^2 - b^2)*c)*cos(2*x)^2 + 4*(2*a*b^2 - 3*a*c^2 - c^3 - (2*a^2 - b^2
)*c)*sin(2*x)^2 + 2*(2*b^3 - b*c^2)*sin(2*x)*sin(x) + (b*c^2*cos(3*x) + b*c
^2*cos(x) + 2*(b^2*c - a*c^2 - c^3)*cos(2*x))*cos(4*x) + (4*b^2*c*cos(x) +
b*c^2 + 2*(2*b^3 - b*c^2)*cos(2*x))*cos(3*x) + 2*(b^2*c - a*c^2 - c^3 + (2*
b^3 - b*c^2)*cos(x))*cos(2*x) + (b*c^2*sin(3*x) + b*c^2*sin(x) + 2*(b^2*c -
 a*c^2 - c^3)*sin(2*x))*sin(4*x) + 2*(2*b^2*c*sin(x) + (2*b^3 - b*c^2)*sin(
2*x))*sin(3*x))/(2*a*c^3 + c^4 + (a^2 - b^2)*c^2 + (2*a*c^3 + c^4 + (a^2 -
b^2)*c^2)*cos(4*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*cos(3*x)^2 +
 4*(4*a^4 - 4*a^2*b^2 + 6*a*c^3 + c^4 + (13*a^2 - b^2)*c^2 + 4*(3*a^3 - a*b
^2)*c)*cos(2*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*cos(x)^2 + (2*a
*c^3 + c^4 + (a^2 - b^2)*c^2)*sin(4*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b
^2*c^2)*sin(3*x)^2 + 4*(4*a^4 - 4*a^2*b^2 + 6*a*c^3 + c^4 + (13*a^2 - b^2)*
c^2 + 4*(3*a^3 - a*b^2)*c)*sin(2*x)^2 + 8*(2*a^3*b - 2*a*b^3 + 4*a*b*c^2 +
b*c^3 + (5*a^2*b - b^3)*c)*sin(2*x)*sin(x) + 4*(a^2*b^2 - b^4 + 2*a*b^2*c +
 b^2*c^2)*sin(x)^2 + 2*(2*a*c^3 + c^4 + (a^2 - b^2)*c^2 + 2*(2*a*b*c^2 + b*
c^3 + (a^2*b - b^3)*c)*cos(3*x) + 2*(4*a*c^3 + c^4 + (5*a^2 - b^2)*c^2 + 2*
(a^3 - a*b^2)*c)*cos(2*x) + 2*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*cos(x))
*cos(4*x) + 4*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c + 2*(2*a^3*b - 2*a*b^3 +
 4*a*b*c^2 + b*c^3 + (5*a^2*b - b^3)*c)*cos(2*x) + 2*(a^2*b^2 - b^4 + 2*a*b
^2*c + b^2*c^2)*cos(x))*cos(3*x) + 4*(4*a*c^3 + c^4 + (5*a^2 - b^2)*c^2 + 2
*(a^3 - a*b^2)*c + 2*(2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + b*c^3 + (5*a^2*b - b^
3)*c)*cos(x))*cos(2*x) + 4*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*cos(x) + 4
*((2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*sin(3*x) + (4*a*c^3 + c^4 + (5*a^2
- b^2)*c^2 + 2*(a^3 - a*b^2)*c)*sin(2*x) + (2*a*b*c^2 + b*c^3 + (a^2*b - b^
3)*c)*sin(x))*sin(4*x) + 8*((2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + b*c^3 + (5*a^2
*b - b^3)*c)*sin(2*x) + (a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*sin(x))*sin(3
*x)), x) - 2*(b*cos(x) - a - c)*sin(2*x) - 2*b*sin(x))/((a^2 - b^2 + 2*a*c
+ c^2)*cos(2*x)^2 + (a^2 - b^2 + 2*a*c + c^2)*sin(2*x)^2 + a^2 - b^2 + 2*a*
c + c^2 - 2*(a^2 - b^2 + 2*a*c + c^2)*cos(2*x))
```

mupad [B] time = 13.53, size = 39229, normalized size = 120.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(sin(x)^2*(a + b*cos(x) + c*cos(x)^2)),x)
```

```
[Out] atan((((-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*
c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a
*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c
^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a
^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*
a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^
4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*
a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a
*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^
2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^
4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^
2 + 14*a*b^8*c)))^(1/2)*(128*a*c^13 - 64*a*b^13 - 32*b^13*c + 32*b^14 - 96*
a^2*b^12 + 256*a^3*b^11 + 64*a^4*b^10 - 384*a^5*b^9 + 64*a^6*b^8 + 256*a^7*
b^7 - 96*a^8*b^6 - 64*a^9*b^5 + 32*a^10*b^4 + 1408*a^2*c^12 + 7040*a^3*c^11
 + 21120*a^4*c^10 + 42240*a^5*c^9 + 59136*a^6*c^8 + 59136*a^7*c^7 + 42240*a
^8*c^6 + 21120*a^9*c^5 + 7040*a^10*c^4 + 1408*a^11*c^3 + 128*a^12*c^2 - 32*
b^2*c^12 + 96*b^3*c^11 + 64*b^4*c^10 - 416*b^5*c^9 + 96*b^6*c^8 + 704*b^7*c
^7 - 384*b^8*c^6 - 576*b^9*c^5 + 416*b^10*c^4 + 224*b^11*c^3 - 192*b^12*c^2
 + tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-
(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 +
 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*
b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c
+ 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2)
 - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a
^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4
+ 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 +
 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c -
96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a
^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b
^2*c^2 + 14*a*b^8*c)))^(1/2)*(64*a*b^14 - 256*a*c^14 + 256*a^14*c - 64*b^14
*c - 128*a^2*b^13 - 256*a^3*b^12 + 640*a^4*b^11 + 320*a^5*b^10 - 1280*a^6*b
^9 + 1280*a^8*b^7 - 320*a^9*b^6 - 640*a^10*b^5 + 256*a^11*b^4 + 128*a^12*b^
3 - 64*a^13*b^2 - 2816*a^2*c^13 - 13824*a^3*c^12 - 39424*a^4*c^11 - 70400*a
^5*c^10 - 76032*a^6*c^9 - 33792*a^7*c^8 + 33792*a^8*c^7 + 76032*a^9*c^6 + 7
0400*a^10*c^5 + 39424*a^11*c^4 + 13824*a^12*c^3 + 2816*a^13*c^2 + 64*b^2*c^
13 - 128*b^3*c^12 - 256*b^4*c^11 + 640*b^5*c^10 + 320*b^6*c^9 - 1280*b^7*c^
8 + 1280*b^9*c^6 - 320*b^10*c^5 - 640*b^11*c^4 + 256*b^12*c^3 + 128*b^13*c^
2 + 1728*a*b^2*c^12 - 3840*a*b^3*c^11 - 3584*a*b^4*c^10 + 10240*a*b^5*c^9 +
 2240*a*b^6*c^8 - 12800*a*b^7*c^7 + 1280*a*b^8*c^6 + 7680*a*b^9*c^5 - 1984*
a*b^10*c^4 - 1792*a*b^11*c^3 + 512*a*b^12*c^2 + 5120*a^2*b*c^12 - 512*a^2*b
^12*c + 22528*a^3*b*c^11 + 1792*a^3*b^11*c + 56320*a^4*b*c^10 + 1984*a^4*b^
10*c + 84480*a^5*b*c^9 - 7680*a^5*b^9*c + 67584*a^6*b*c^8 - 1280*a^6*b^8*c
+ 12800*a^7*b^7*c - 67584*a^8*b*c^6 - 2240*a^8*b^6*c - 84480*a^9*b*c^5 - 10
240*a^9*b^5*c - 56320*a^10*b*c^4 + 3584*a^10*b^4*c - 22528*a^11*b*c^3 + 384
0*a^11*b^3*c - 5120*a^12*b*c^2 - 1728*a^12*b^2*c + 12672*a^2*b^2*c^11 - 261
```

```
12*a^2*b^3*c^10 - 17920*a^2*b^4*c^9 + 48000*a^2*b^5*c^8 + 6400*a^2*b^6*c^7
- 38400*a^2*b^7*c^6 + 3840*a^2*b^8*c^5 + 11520*a^2*b^9*c^4 - 1664*a^2*b^10*
c^3 + 45696*a^3*b^2*c^10 - 83200*a^3*b^3*c^9 - 44800*a^3*b^4*c^8 + 102400*a
^3*b^5*c^7 + 8960*a^3*b^6*c^6 - 43520*a^3*b^7*c^5 + 2560*a^3*b^8*c^4 + 1664
*a^3*b^10*c^2 + 94400*a^4*b^2*c^9 - 144000*a^4*b^3*c^8 - 58880*a^4*b^4*c^7
+ 98560*a^4*b^5*c^6 + 4480*a^4*b^6*c^5 - 2560*a^4*b^8*c^3 - 11520*a^4*b^9*c
^2 + 111168*a^5*b^2*c^8 - 124416*a^5*b^3*c^7 - 28672*a^5*b^4*c^6 - 4480*a^5
*b^6*c^4 + 43520*a^5*b^7*c^3 - 3840*a^5*b^8*c^2 + 51456*a^6*b^2*c^7 + 28672
*a^6*b^4*c^5 - 98560*a^6*b^5*c^4 - 8960*a^6*b^6*c^3 + 38400*a^6*b^7*c^2 - 5
1456*a^7*b^2*c^6 + 124416*a^7*b^3*c^5 + 58880*a^7*b^4*c^4 - 102400*a^7*b^5*
c^3 - 6400*a^7*b^6*c^2 - 111168*a^8*b^2*c^5 + 144000*a^8*b^3*c^4 + 44800*a^
8*b^4*c^3 - 48000*a^8*b^5*c^2 - 94400*a^9*b^2*c^4 + 83200*a^9*b^3*c^3 + 179
20*a^9*b^4*c^2 - 45696*a^10*b^2*c^3 + 26112*a^10*b^3*c^2 - 12672*a^11*b^2*c
^2 + 512*a*b*c^13 - 512*a^13*b*c) - 608*a*b^2*c^11 + 2624*a*b^3*c^10 + 224*
a*b^4*c^9 - 6208*a*b^5*c^8 + 2112*a*b^6*c^7 + 6784*a*b^7*c^6 - 3520*a*b^8*c
^5 - 3584*a*b^9*c^4 + 2080*a*b^10*c^3 + 832*a*b^11*c^2 - 3840*a^2*b*c^11 +
992*a^2*b^11*c - 17280*a^3*b*c^10 + 992*a^3*b^10*c - 46080*a^4*b*c^9 - 3136
*a^4*b^9*c - 80640*a^5*b*c^8 - 320*a^5*b^8*c - 96768*a^6*b*c^7 + 3776*a^6*b
^7*c - 80640*a^7*b*c^6 - 832*a^7*b^6*c - 46080*a^8*b*c^5 - 1952*a^8*b^5*c -
 17280*a^9*b*c^4 + 736*a^9*b^4*c - 3840*a^10*b*c^3 + 352*a^10*b^3*c - 384*a
^11*b*c^2 - 160*a^11*b^2*c - 4192*a^2*b^2*c^10 + 17888*a^2*b^3*c^9 + 288*a^
2*b^4*c^8 - 30080*a^2*b^5*c^7 + 8768*a^2*b^6*c^6 + 22848*a^2*b^7*c^5 - 8768
*a^2*b^8*c^4 - 7808*a^2*b^9*c^3 + 2592*a^2*b^10*c^2 - 15648*a^3*b^2*c^9 + 6
0160*a^3*b^3*c^8 + 1152*a^3*b^4*c^7 - 73472*a^3*b^5*c^6 + 15424*a^3*b^6*c^5
 + 37888*a^3*b^7*c^4 - 8960*a^3*b^8*c^3 - 7552*a^3*b^9*c^2 - 36672*a^4*b^2*
c^8 + 120512*a^4*b^3*c^7 + 5376*a^4*b^4*c^6 - 104384*a^4*b^5*c^5 + 12800*a^
4*b^6*c^4 + 34112*a^4*b^7*c^3 - 3712*a^4*b^8*c^2 - 57792*a^5*b^2*c^7 + 1550
08*a^5*b^3*c^6 + 12096*a^5*b^4*c^5 - 90496*a^5*b^5*c^4 + 3776*a^5*b^6*c^3 +
 16512*a^5*b^7*c^2 - 63168*a^6*b^2*c^6 + 131264*a^6*b^3*c^5 + 14784*a^6*b^4
*c^4 - 47488*a^6*b^5*c^3 - 1088*a^6*b^6*c^2 - 48192*a^7*b^2*c^5 + 72448*a^7
*b^3*c^4 + 10368*a^7*b^4*c^3 - 14080*a^7*b^5*c^2 - 25248*a^8*b^2*c^4 + 2480
0*a^8*b^3*c^3 + 4032*a^8*b^4*c^2 - 8672*a^9*b^2*c^3 + 4672*a^9*b^3*c^2 - 17
60*a^10*b^2*c^2 - 384*a*b*c^12 - 416*a*b^12*c) + tan(x/2)*(32*a*b^12 - 512*
a*c^12 + 128*b*c^12 + 96*b^12*c - 32*b^13 - 64*c^13 + 96*a^2*b^11 - 96*a^3*
b^10 - 96*a^4*b^9 + 96*a^5*b^8 + 32*a^6*b^7 - 32*a^7*b^6 - 1728*a^2*c^11 -
3072*a^3*c^10 - 2688*a^4*c^9 + 2688*a^6*c^7 + 3072*a^7*c^6 + 1728*a^8*c^5 +
 512*a^9*c^4 + 64*a^10*c^3 + 160*b^2*c^11 - 544*b^3*c^10 + 64*b^4*c^9 + 896
*b^5*c^8 - 608*b^6*c^7 - 672*b^7*c^6 + 800*b^8*c^5 + 160*b^9*c^4 - 448*b^10
*c^3 + 64*b^11*c^2 + 480*a*b^2*c^10 - 4352*a*b^3*c^9 + 2560*a*b^4*c^8 + 524
8*a*b^5*c^7 - 5664*a*b^6*c^6 - 2240*a*b^7*c^5 + 4320*a*b^8*c^4 - 256*a*b^9*
c^3 - 1216*a*b^10*c^2 + 5632*a^2*b*c^10 - 672*a^2*b^10*c + 14336*a^3*b*c^9
- 768*a^3*b^9*c + 23296*a^4*b*c^8 + 1248*a^4*b^8*c + 25088*a^5*b*c^7 + 576*
a^5*b^7*c + 17920*a^6*b*c^6 - 864*a^6*b^6*c + 8192*a^7*b*c^5 - 128*a^7*b^5*
c + 2176*a^8*b*c^4 + 192*a^8*b^4*c + 256*a^9*b*c^3 - 1408*a^2*b^2*c^9 - 147
20*a^2*b^3*c^8 + 13440*a^2*b^4*c^7 + 11904*a^2*b^5*c^6 - 16800*a^2*b^6*c^5
```

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- 1696*a^2*b^7*c^4 + 7168*a^2*b^8*c^3 - 1216*a^2*b^9*c^2 - 9856*a^3*b^2*c^8
 - 27392*a^3*b^3*c^7 + 31232*a^3*b^4*c^6 + 12928*a^3*b^5*c^5 - 23264*a^3*b^
6*c^4 + 1152*a^3*b^7*c^3 + 4800*a^3*b^8*c^2 - 22848*a^4*b^2*c^7 - 30400*a^4
*b^3*c^6 + 39680*a^4*b^4*c^5 + 6272*a^4*b^5*c^4 - 16544*a^4*b^6*c^3 + 1824*
a^4*b^7*c^2 - 29120*a^5*b^2*c^6 - 20224*a^5*b^3*c^5 + 29184*a^5*b^4*c^4 + 3
84*a^5*b^5*c^3 - 5856*a^5*b^6*c^2 - 22400*a^6*b^2*c^5 - 7552*a^6*b^3*c^4 +
12160*a^6*b^4*c^3 - 640*a^6*b^5*c^2 - 10368*a^7*b^2*c^4 - 1280*a^7*b^3*c^3
+ 2560*a^7*b^4*c^2 - 2656*a^8*b^2*c^3 - 32*a^8*b^3*c^2 - 288*a^9*b^2*c^2 +
1280*a*b*c^11 + 320*a*b^11*c))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 +
 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c
^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^
2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^
(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*
a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b
^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5
*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*
c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4
*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*
a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5
*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*1i - ((-(8*a*c^7 + b^8 + 24
*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^
6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c
- b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*
c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^
(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7
+ 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c
^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36
*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4
- 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 15
9*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(128
*a*c^13 - 64*a*b^13 - 32*b^13*c + 32*b^14 - 96*a^2*b^12 + 256*a^3*b^11 + 64
*a^4*b^10 - 384*a^5*b^9 + 64*a^6*b^8 + 256*a^7*b^7 - 96*a^8*b^6 - 64*a^9*b^
5 + 32*a^10*b^4 + 1408*a^2*c^12 + 7040*a^3*c^11 + 21120*a^4*c^10 + 42240*a^
5*c^9 + 59136*a^6*c^8 + 59136*a^7*c^7 + 42240*a^8*c^6 + 21120*a^9*c^5 + 704
0*a^10*c^4 + 1408*a^11*c^3 + 128*a^12*c^2 - 32*b^2*c^12 + 96*b^3*c^11 + 64*
b^4*c^10 - 416*b^5*c^9 + 96*b^6*c^8 + 704*b^7*c^7 - 384*b^8*c^6 - 576*b^9*c
^5 + 416*b^10*c^4 + 224*b^11*c^3 - 192*b^12*c^2 - tan(x/2)*(-(8*a*c^7 + b^8
 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b
^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4
*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3
*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2
)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)
^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3
*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 +
```

```
b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3
 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4
*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4
 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)
*(64*a*b^14 - 256*a*c^14 + 256*a^14*c - 64*b^14*c - 128*a^2*b^13 - 256*a^3*
b^12 + 640*a^4*b^11 + 320*a^5*b^10 - 1280*a^6*b^9 + 1280*a^8*b^7 - 320*a^9*
b^6 - 640*a^10*b^5 + 256*a^11*b^4 + 128*a^12*b^3 - 64*a^13*b^2 - 2816*a^2*c
^13 - 13824*a^3*c^12 - 39424*a^4*c^11 - 70400*a^5*c^10 - 76032*a^6*c^9 - 33
792*a^7*c^8 + 33792*a^8*c^7 + 76032*a^9*c^6 + 70400*a^10*c^5 + 39424*a^11*c
^4 + 13824*a^12*c^3 + 2816*a^13*c^2 + 64*b^2*c^13 - 128*b^3*c^12 - 256*b^4*
c^11 + 640*b^5*c^10 + 320*b^6*c^9 - 1280*b^7*c^8 + 1280*b^9*c^6 - 320*b^10*
c^5 - 640*b^11*c^4 + 256*b^12*c^3 + 128*b^13*c^2 + 1728*a*b^2*c^12 - 3840*a
*b^3*c^11 - 3584*a*b^4*c^10 + 10240*a*b^5*c^9 + 2240*a*b^6*c^8 - 12800*a*b^
7*c^7 + 1280*a*b^8*c^6 + 7680*a*b^9*c^5 - 1984*a*b^10*c^4 - 1792*a*b^11*c^3
 + 512*a*b^12*c^2 + 5120*a^2*b*c^12 - 512*a^2*b^12*c + 22528*a^3*b*c^11 + 1
792*a^3*b^11*c + 56320*a^4*b*c^10 + 1984*a^4*b^10*c + 84480*a^5*b*c^9 - 768
0*a^5*b^9*c + 67584*a^6*b*c^8 - 1280*a^6*b^8*c + 12800*a^7*b^7*c - 67584*a^
8*b*c^6 - 2240*a^8*b^6*c - 84480*a^9*b*c^5 - 10240*a^9*b^5*c - 56320*a^10*b
*c^4 + 3584*a^10*b^4*c - 22528*a^11*b*c^3 + 3840*a^11*b^3*c - 5120*a^12*b*c
^2 - 1728*a^12*b^2*c + 12672*a^2*b^2*c^11 - 26112*a^2*b^3*c^10 - 17920*a^2*
b^4*c^9 + 48000*a^2*b^5*c^8 + 6400*a^2*b^6*c^7 - 38400*a^2*b^7*c^6 + 3840*a
^2*b^8*c^5 + 11520*a^2*b^9*c^4 - 1664*a^2*b^10*c^3 + 45696*a^3*b^2*c^10 - 8
3200*a^3*b^3*c^9 - 44800*a^3*b^4*c^8 + 102400*a^3*b^5*c^7 + 8960*a^3*b^6*c^
6 - 43520*a^3*b^7*c^5 + 2560*a^3*b^8*c^4 + 1664*a^3*b^10*c^2 + 94400*a^4*b^
2*c^9 - 144000*a^4*b^3*c^8 - 58880*a^4*b^4*c^7 + 98560*a^4*b^5*c^6 + 4480*a
^4*b^6*c^5 - 2560*a^4*b^8*c^3 - 11520*a^4*b^9*c^2 + 111168*a^5*b^2*c^8 - 12
4416*a^5*b^3*c^7 - 28672*a^5*b^4*c^6 - 4480*a^5*b^6*c^4 + 43520*a^5*b^7*c^3
 - 3840*a^5*b^8*c^2 + 51456*a^6*b^2*c^7 + 28672*a^6*b^4*c^5 - 98560*a^6*b^5
*c^4 - 8960*a^6*b^6*c^3 + 38400*a^6*b^7*c^2 - 51456*a^7*b^2*c^6 + 124416*a^
7*b^3*c^5 + 58880*a^7*b^4*c^4 - 102400*a^7*b^5*c^3 - 6400*a^7*b^6*c^2 - 111
168*a^8*b^2*c^5 + 144000*a^8*b^3*c^4 + 44800*a^8*b^4*c^3 - 48000*a^8*b^5*c^
2 - 94400*a^9*b^2*c^4 + 83200*a^9*b^3*c^3 + 17920*a^9*b^4*c^2 - 45696*a^10*
b^2*c^3 + 26112*a^10*b^3*c^2 - 12672*a^11*b^2*c^2 + 512*a*b*c^13 - 512*a^13
*b*c) - 608*a*b^2*c^11 + 2624*a*b^3*c^10 + 224*a*b^4*c^9 - 6208*a*b^5*c^8 +
 2112*a*b^6*c^7 + 6784*a*b^7*c^6 - 3520*a*b^8*c^5 - 3584*a*b^9*c^4 + 2080*a
*b^10*c^3 + 832*a*b^11*c^2 - 3840*a^2*b*c^11 + 992*a^2*b^11*c - 17280*a^3*b
*c^10 + 992*a^3*b^10*c - 46080*a^4*b*c^9 - 3136*a^4*b^9*c - 80640*a^5*b*c^8
 - 320*a^5*b^8*c - 96768*a^6*b*c^7 + 3776*a^6*b^7*c - 80640*a^7*b*c^6 - 832
*a^7*b^6*c - 46080*a^8*b*c^5 - 1952*a^8*b^5*c - 17280*a^9*b*c^4 + 736*a^9*b
^4*c - 3840*a^10*b*c^3 + 352*a^10*b^3*c - 384*a^11*b*c^2 - 160*a^11*b^2*c -
 4192*a^2*b^2*c^10 + 17888*a^2*b^3*c^9 + 288*a^2*b^4*c^8 - 30080*a^2*b^5*c^
7 + 8768*a^2*b^6*c^6 + 22848*a^2*b^7*c^5 - 8768*a^2*b^8*c^4 - 7808*a^2*b^9*
c^3 + 2592*a^2*b^10*c^2 - 15648*a^3*b^2*c^9 + 60160*a^3*b^3*c^8 + 1152*a^3*
b^4*c^7 - 73472*a^3*b^5*c^6 + 15424*a^3*b^6*c^5 + 37888*a^3*b^7*c^4 - 8960*
a^3*b^8*c^3 - 7552*a^3*b^9*c^2 - 36672*a^4*b^2*c^8 + 120512*a^4*b^3*c^7 + 5
```

376*a^4*b^4*c^6 - 104384*a^4*b^5*c^5 + 12800*a^4*b^6*c^4 + 34112*a^4*b^7*c^
3 - 3712*a^4*b^8*c^2 - 57792*a^5*b^2*c^7 + 155008*a^5*b^3*c^6 + 12096*a^5*b
^4*c^5 - 90496*a^5*b^5*c^4 + 3776*a^5*b^6*c^3 + 16512*a^5*b^7*c^2 - 63168*a
^6*b^2*c^6 + 131264*a^6*b^3*c^5 + 14784*a^6*b^4*c^4 - 47488*a^6*b^5*c^3 - 1
088*a^6*b^6*c^2 - 48192*a^7*b^2*c^5 + 72448*a^7*b^3*c^4 + 10368*a^7*b^4*c^3
 - 14080*a^7*b^5*c^2 - 25248*a^8*b^2*c^4 + 24800*a^8*b^3*c^3 + 4032*a^8*b^4
*c^2 - 8672*a^9*b^2*c^3 + 4672*a^9*b^3*c^2 - 1760*a^10*b^2*c^2 - 384*a*b*c^
12 - 416*a*b^12*c) - tan(x/2)*(32*a*b^12 - 512*a*c^12 + 128*b*c^12 + 96*b^1
2*c - 32*b^13 - 64*c^13 + 96*a^2*b^11 - 96*a^3*b^10 - 96*a^4*b^9 + 96*a^5*b
^8 + 32*a^6*b^7 - 32*a^7*b^6 - 1728*a^2*c^11 - 3072*a^3*c^10 - 2688*a^4*c^9
 + 2688*a^6*c^7 + 3072*a^7*c^6 + 1728*a^8*c^5 + 512*a^9*c^4 + 64*a^10*c^3 +
 160*b^2*c^11 - 544*b^3*c^10 + 64*b^4*c^9 + 896*b^5*c^8 - 608*b^6*c^7 - 672
*b^7*c^6 + 800*b^8*c^5 + 160*b^9*c^4 - 448*b^10*c^3 + 64*b^11*c^2 + 480*a*b
^2*c^10 - 4352*a*b^3*c^9 + 2560*a*b^4*c^8 + 5248*a*b^5*c^7 - 5664*a*b^6*c^6
 - 2240*a*b^7*c^5 + 4320*a*b^8*c^4 - 256*a*b^9*c^3 - 1216*a*b^10*c^2 + 5632
*a^2*b*c^10 - 672*a^2*b^10*c + 14336*a^3*b*c^9 - 768*a^3*b^9*c + 23296*a^4*
b*c^8 + 1248*a^4*b^8*c + 25088*a^5*b*c^7 + 576*a^5*b^7*c + 17920*a^6*b*c^6
 - 864*a^6*b^6*c + 8192*a^7*b*c^5 - 128*a^7*b^5*c + 2176*a^8*b*c^4 + 192*a^8
*b^4*c + 256*a^9*b*c^3 - 1408*a^2*b^2*c^9 - 14720*a^2*b^3*c^8 + 13440*a^2*b
^4*c^7 + 11904*a^2*b^5*c^6 - 16800*a^2*b^6*c^5 - 1696*a^2*b^7*c^4 + 7168*a^
2*b^8*c^3 - 1216*a^2*b^9*c^2 - 9856*a^3*b^2*c^8 - 27392*a^3*b^3*c^7 + 31232
*a^3*b^4*c^6 + 12928*a^3*b^5*c^5 - 23264*a^3*b^6*c^4 + 1152*a^3*b^7*c^3 + 4
800*a^3*b^8*c^2 - 22848*a^4*b^2*c^7 - 30400*a^4*b^3*c^6 + 39680*a^4*b^4*c^5
 + 6272*a^4*b^5*c^4 - 16544*a^4*b^6*c^3 + 1824*a^4*b^7*c^2 - 29120*a^5*b^2*
c^6 - 20224*a^5*b^3*c^5 + 29184*a^5*b^4*c^4 + 384*a^5*b^5*c^3 - 5856*a^5*b^
6*c^2 - 22400*a^6*b^2*c^5 - 7552*a^6*b^3*c^4 + 12160*a^6*b^4*c^3 - 640*a^6*
b^5*c^2 - 10368*a^7*b^2*c^4 - 1280*a^7*b^3*c^3 + 2560*a^7*b^4*c^2 - 2656*a^
8*b^2*c^3 - 32*a^8*b^3*c^2 - 288*a^9*b^2*c^2 + 1280*a*b*c^11 + 320*a*b^11*c
))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c -
b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4
*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 -
 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b
c^2(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^
3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 +
16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*
c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4
*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^
2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^
3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 +
14*a*b^8*c)))^(1/2)*1i)/(512*a*c^11 + 64*c^12 + ((-(8*a*c^7 + b^8 + 24*a^2*
c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3
*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2
)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(
-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2)
 + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))

/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240
*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 -
3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*
b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*
a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4
*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(128*a*c^
13 - 64*a*b^13 - 32*b^13*c + 32*b^14 - 96*a^2*b^12 + 256*a^3*b^11 + 64*a^4*
b^10 - 384*a^5*b^9 + 64*a^6*b^8 + 256*a^7*b^7 - 96*a^8*b^6 - 64*a^9*b^5 + 3
2*a^10*b^4 + 1408*a^2*c^12 + 7040*a^3*c^11 + 21120*a^4*c^10 + 42240*a^5*c^9
 + 59136*a^6*c^8 + 59136*a^7*c^7 + 42240*a^8*c^6 + 21120*a^9*c^5 + 7040*a^1
0*c^4 + 1408*a^11*c^3 + 128*a^12*c^2 - 32*b^2*c^12 + 96*b^3*c^11 + 64*b^4*c
^10 - 416*b^5*c^9 + 96*b^6*c^8 + 704*b^7*c^7 - 384*b^8*c^6 - 576*b^9*c^5 +
416*b^10*c^4 + 224*b^11*c^3 - 192*b^12*c^2 + tan(x/2)*(-(8*a*c^7 + b^8 + 24
*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^
6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c
- b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*
c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^
(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7
+ 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c
^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36
*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4
- 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 15
9*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(64*
a*b^14 - 256*a*c^14 + 256*a^14*c - 64*b^14*c - 128*a^2*b^13 - 256*a^3*b^12
+ 640*a^4*b^11 + 320*a^5*b^10 - 1280*a^6*b^9 + 1280*a^8*b^7 - 320*a^9*b^6 -
 640*a^10*b^5 + 256*a^11*b^4 + 128*a^12*b^3 - 64*a^13*b^2 - 2816*a^2*c^13 -
 13824*a^3*c^12 - 39424*a^4*c^11 - 70400*a^5*c^10 - 76032*a^6*c^9 - 33792*a
^7*c^8 + 33792*a^8*c^7 + 76032*a^9*c^6 + 70400*a^10*c^5 + 39424*a^11*c^4 +
13824*a^12*c^3 + 2816*a^13*c^2 + 64*b^2*c^13 - 128*b^3*c^12 - 256*b^4*c^11
+ 640*b^5*c^10 + 320*b^6*c^9 - 1280*b^7*c^8 + 1280*b^9*c^6 - 320*b^10*c^5 -
 640*b^11*c^4 + 256*b^12*c^3 + 128*b^13*c^2 + 1728*a*b^2*c^12 - 3840*a*b^3*
c^11 - 3584*a*b^4*c^10 + 10240*a*b^5*c^9 + 2240*a*b^6*c^8 - 12800*a*b^7*c^7
 + 1280*a*b^8*c^6 + 7680*a*b^9*c^5 - 1984*a*b^10*c^4 - 1792*a*b^11*c^3 + 51
2*a*b^12*c^2 + 5120*a^2*b*c^12 - 512*a^2*b^12*c + 22528*a^3*b*c^11 + 1792*a
^3*b^11*c + 56320*a^4*b*c^10 + 1984*a^4*b^10*c + 84480*a^5*b*c^9 - 7680*a^5
*b^9*c + 67584*a^6*b*c^8 - 1280*a^6*b^8*c + 12800*a^7*b^7*c - 67584*a^8*b*c
^6 - 2240*a^8*b^6*c - 84480*a^9*b*c^5 - 10240*a^9*b^5*c - 56320*a^10*b*c^4
+ 3584*a^10*b^4*c - 22528*a^11*b*c^3 + 3840*a^11*b^3*c - 5120*a^12*b*c^2 -
1728*a^12*b^2*c + 12672*a^2*b^2*c^11 - 26112*a^2*b^3*c^10 - 17920*a^2*b^4*c
^9 + 48000*a^2*b^5*c^8 + 6400*a^2*b^6*c^7 - 38400*a^2*b^7*c^6 + 3840*a^2*b^
8*c^5 + 11520*a^2*b^9*c^4 - 1664*a^2*b^10*c^3 + 45696*a^3*b^2*c^10 - 83200*
a^3*b^3*c^9 - 44800*a^3*b^4*c^8 + 102400*a^3*b^5*c^7 + 8960*a^3*b^6*c^6 - 4
3520*a^3*b^7*c^5 + 2560*a^3*b^8*c^4 + 1664*a^3*b^10*c^2 + 94400*a^4*b^2*c^9
 - 144000*a^4*b^3*c^8 - 58880*a^4*b^4*c^7 + 98560*a^4*b^5*c^6 + 4480*a^4*b^

6*c^5 - 2560*a^4*b^8*c^3 - 11520*a^4*b^9*c^2 + 111168*a^5*b^2*c^8 - 124416*
a^5*b^3*c^7 - 28672*a^5*b^4*c^6 - 4480*a^5*b^6*c^4 + 43520*a^5*b^7*c^3 - 38
40*a^5*b^8*c^2 + 51456*a^6*b^2*c^7 + 28672*a^6*b^4*c^5 - 98560*a^6*b^5*c^4
- 8960*a^6*b^6*c^3 + 38400*a^6*b^7*c^2 - 51456*a^7*b^2*c^6 + 124416*a^7*b^3
*c^5 + 58880*a^7*b^4*c^4 - 102400*a^7*b^5*c^3 - 6400*a^7*b^6*c^2 - 111168*a
^8*b^2*c^5 + 144000*a^8*b^3*c^4 + 44800*a^8*b^4*c^3 - 48000*a^8*b^5*c^2 - 9
4400*a^9*b^2*c^4 + 83200*a^9*b^3*c^3 + 17920*a^9*b^4*c^2 - 45696*a^10*b^2*c
^3 + 26112*a^10*b^3*c^2 - 12672*a^11*b^2*c^2 + 512*a*b*c^13 - 512*a^13*b*c)
 - 608*a*b^2*c^11 + 2624*a*b^3*c^10 + 224*a*b^4*c^9 - 6208*a*b^5*c^8 + 2112
*a*b^6*c^7 + 6784*a*b^7*c^6 - 3520*a*b^8*c^5 - 3584*a*b^9*c^4 + 2080*a*b^10
*c^3 + 832*a*b^11*c^2 - 3840*a^2*b*c^11 + 992*a^2*b^11*c - 17280*a^3*b*c^10
 + 992*a^3*b^10*c - 46080*a^4*b*c^9 - 3136*a^4*b^9*c - 80640*a^5*b*c^8 - 32
0*a^5*b^8*c - 96768*a^6*b*c^7 + 3776*a^6*b^7*c - 80640*a^7*b*c^6 - 832*a^7*
b^6*c - 46080*a^8*b*c^5 - 1952*a^8*b^5*c - 17280*a^9*b*c^4 + 736*a^9*b^4*c
- 3840*a^10*b*c^3 + 352*a^10*b^3*c - 384*a^11*b*c^2 - 160*a^11*b^2*c - 4192
*a^2*b^2*c^10 + 17888*a^2*b^3*c^9 + 288*a^2*b^4*c^8 - 30080*a^2*b^5*c^7 + 8
768*a^2*b^6*c^6 + 22848*a^2*b^7*c^5 - 8768*a^2*b^8*c^4 - 7808*a^2*b^9*c^3 +
 2592*a^2*b^10*c^2 - 15648*a^3*b^2*c^9 + 60160*a^3*b^3*c^8 + 1152*a^3*b^4*c
^7 - 73472*a^3*b^5*c^6 + 15424*a^3*b^6*c^5 + 37888*a^3*b^7*c^4 - 8960*a^3*b
^8*c^3 - 7552*a^3*b^9*c^2 - 36672*a^4*b^2*c^8 + 120512*a^4*b^3*c^7 + 5376*a
^4*b^4*c^6 - 104384*a^4*b^5*c^5 + 12800*a^4*b^6*c^4 + 34112*a^4*b^7*c^3 - 3
712*a^4*b^8*c^2 - 57792*a^5*b^2*c^7 + 155008*a^5*b^3*c^6 + 12096*a^5*b^4*c^
5 - 90496*a^5*b^5*c^4 + 3776*a^5*b^6*c^3 + 16512*a^5*b^7*c^2 - 63168*a^6*b^
2*c^6 + 131264*a^6*b^3*c^5 + 14784*a^6*b^4*c^4 - 47488*a^6*b^5*c^3 - 1088*a
^6*b^6*c^2 - 48192*a^7*b^2*c^5 + 72448*a^7*b^3*c^4 + 10368*a^7*b^4*c^3 - 14
080*a^7*b^5*c^2 - 25248*a^8*b^2*c^4 + 24800*a^8*b^3*c^3 + 4032*a^8*b^4*c^2
- 8672*a^9*b^2*c^3 + 4672*a^9*b^3*c^2 - 1760*a^10*b^2*c^2 - 384*a*b*c^12 -
416*a*b^12*c) + tan(x/2)*(32*a*b^12 - 512*a*c^12 + 128*b*c^12 + 96*b^12*c -
 32*b^13 - 64*c^13 + 96*a^2*b^11 - 96*a^3*b^10 - 96*a^4*b^9 + 96*a^5*b^8 +
32*a^6*b^7 - 32*a^7*b^6 - 1728*a^2*c^11 - 3072*a^3*c^10 - 2688*a^4*c^9 + 26
88*a^6*c^7 + 3072*a^7*c^6 + 1728*a^8*c^5 + 512*a^9*c^4 + 64*a^10*c^3 + 160*
b^2*c^11 - 544*b^3*c^10 + 64*b^4*c^9 + 896*b^5*c^8 - 608*b^6*c^7 - 672*b^7*
c^6 + 800*b^8*c^5 + 160*b^9*c^4 - 448*b^10*c^3 + 64*b^11*c^2 + 480*a*b^2*c^
10 - 4352*a*b^3*c^9 + 2560*a*b^4*c^8 + 5248*a*b^5*c^7 - 5664*a*b^6*c^6 - 22
40*a*b^7*c^5 + 4320*a*b^8*c^4 - 256*a*b^9*c^3 - 1216*a*b^10*c^2 + 5632*a^2*
b*c^10 - 672*a^2*b^10*c + 14336*a^3*b*c^9 - 768*a^3*b^9*c + 23296*a^4*b*c^8
 + 1248*a^4*b^8*c + 25088*a^5*b*c^7 + 576*a^5*b^7*c + 17920*a^6*b*c^6 - 864
*a^6*b^6*c + 8192*a^7*b*c^5 - 128*a^7*b^5*c + 2176*a^8*b*c^4 + 192*a^8*b^4*
c + 256*a^9*b*c^3 - 1408*a^2*b^2*c^9 - 14720*a^2*b^3*c^8 + 13440*a^2*b^4*c^
7 + 11904*a^2*b^5*c^6 - 16800*a^2*b^6*c^5 - 1696*a^2*b^7*c^4 + 7168*a^2*b^8
*c^3 - 1216*a^2*b^9*c^2 - 9856*a^3*b^2*c^8 - 27392*a^3*b^3*c^7 + 31232*a^3*
b^4*c^6 + 12928*a^3*b^5*c^5 - 23264*a^3*b^6*c^4 + 1152*a^3*b^7*c^3 + 4800*a
^3*b^8*c^2 - 22848*a^4*b^2*c^7 - 30400*a^4*b^3*c^6 + 39680*a^4*b^4*c^5 + 62
72*a^4*b^5*c^4 - 16544*a^4*b^6*c^3 + 1824*a^4*b^7*c^2 - 29120*a^5*b^2*c^6 -
 20224*a^5*b^3*c^5 + 29184*a^5*b^4*c^4 + 384*a^5*b^5*c^3 - 5856*a^5*b^6*c^2

- 22400*a^6*b^2*c^5 - 7552*a^6*b^3*c^4 + 12160*a^6*b^4*c^3 - 640*a^6*b^5*c
^2 - 10368*a^7*b^2*c^4 - 1280*a^7*b^3*c^3 + 2560*a^7*b^4*c^2 - 2656*a^8*b^2
*c^3 - 32*a^8*b^3*c^2 - 288*a^9*b^2*c^2 + 1280*a*b*c^11 + 320*a*b^11*c))*(-
(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^
3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3
+ 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a
^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*
(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(
-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^
2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 +
16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5
- 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6
+ 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 4
48*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*
b^8*c)))^(1/2) + ((-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 +
b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2
*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 3
3*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*
b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)
^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b
^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^
6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2
*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^
2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 +
260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96
*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(128*a*c^13 - 64*a*b^13 - 32*b^13*c + 32
*b^14 - 96*a^2*b^12 + 256*a^3*b^11 + 64*a^4*b^10 - 384*a^5*b^9 + 64*a^6*b^8
+ 256*a^7*b^7 - 96*a^8*b^6 - 64*a^9*b^5 + 32*a^10*b^4 + 1408*a^2*c^12 + 70
40*a^3*c^11 + 21120*a^4*c^10 + 42240*a^5*c^9 + 59136*a^6*c^8 + 59136*a^7*c^
7 + 42240*a^8*c^6 + 21120*a^9*c^5 + 7040*a^10*c^4 + 1408*a^11*c^3 + 128*a^1
2*c^2 - 32*b^2*c^12 + 96*b^3*c^11 + 64*b^4*c^10 - 416*b^5*c^9 + 96*b^6*c^8
+ 704*b^7*c^7 - 384*b^8*c^6 - 576*b^9*c^5 + 416*b^10*c^4 + 224*b^11*c^3 - 1
92*b^12*c^2 - tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c
^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*
a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^
4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) -
10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^
2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*
a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 2
40*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*
a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a
^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*
c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3
- 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(64*a*b^14 - 256*a*c^14 + 256*a^14*
c - 64*b^14*c - 128*a^2*b^13 - 256*a^3*b^12 + 640*a^4*b^11 + 320*a^5*b^10 -

```
 1280*a^6*b^9 + 1280*a^8*b^7 - 320*a^9*b^6 - 640*a^10*b^5 + 256*a^11*b^4 +
128*a^12*b^3 - 64*a^13*b^2 - 2816*a^2*c^13 - 13824*a^3*c^12 - 39424*a^4*c^1
1 - 70400*a^5*c^10 - 76032*a^6*c^9 - 33792*a^7*c^8 + 33792*a^8*c^7 + 76032*
a^9*c^6 + 70400*a^10*c^5 + 39424*a^11*c^4 + 13824*a^12*c^3 + 2816*a^13*c^2
+ 64*b^2*c^13 - 128*b^3*c^12 - 256*b^4*c^11 + 640*b^5*c^10 + 320*b^6*c^9 -
1280*b^7*c^8 + 1280*b^9*c^6 - 320*b^10*c^5 - 640*b^11*c^4 + 256*b^12*c^3 +
128*b^13*c^2 + 1728*a*b^2*c^12 - 3840*a*b^3*c^11 - 3584*a*b^4*c^10 + 10240*
a*b^5*c^9 + 2240*a*b^6*c^8 - 12800*a*b^7*c^7 + 1280*a*b^8*c^6 + 7680*a*b^9*
c^5 - 1984*a*b^10*c^4 - 1792*a*b^11*c^3 + 512*a*b^12*c^2 + 5120*a^2*b*c^12
- 512*a^2*b^12*c + 22528*a^3*b*c^11 + 1792*a^3*b^11*c + 56320*a^4*b*c^10 +
1984*a^4*b^10*c + 84480*a^5*b*c^9 - 7680*a^5*b^9*c + 67584*a^6*b*c^8 - 1280
*a^6*b^8*c + 12800*a^7*b^7*c - 67584*a^8*b*c^6 - 2240*a^8*b^6*c - 84480*a^9
*b*c^5 - 10240*a^9*b^5*c - 56320*a^10*b*c^4 + 3584*a^10*b^4*c - 22528*a^11*
b*c^3 + 3840*a^11*b^3*c - 5120*a^12*b*c^2 - 1728*a^12*b^2*c + 12672*a^2*b^2
*c^11 - 26112*a^2*b^3*c^10 - 17920*a^2*b^4*c^9 + 48000*a^2*b^5*c^8 + 6400*a
^2*b^6*c^7 - 38400*a^2*b^7*c^6 + 3840*a^2*b^8*c^5 + 11520*a^2*b^9*c^4 - 166
4*a^2*b^10*c^3 + 45696*a^3*b^2*c^10 - 83200*a^3*b^3*c^9 - 44800*a^3*b^4*c^8
 + 102400*a^3*b^5*c^7 + 8960*a^3*b^6*c^6 - 43520*a^3*b^7*c^5 + 2560*a^3*b^8
*c^4 + 1664*a^3*b^10*c^2 + 94400*a^4*b^2*c^9 - 144000*a^4*b^3*c^8 - 58880*a
^4*b^4*c^7 + 98560*a^4*b^5*c^6 + 4480*a^4*b^6*c^5 - 2560*a^4*b^8*c^3 - 1152
0*a^4*b^9*c^2 + 111168*a^5*b^2*c^8 - 124416*a^5*b^3*c^7 - 28672*a^5*b^4*c^6
 - 4480*a^5*b^6*c^4 + 43520*a^5*b^7*c^3 - 3840*a^5*b^8*c^2 + 51456*a^6*b^2*
c^7 + 28672*a^6*b^4*c^5 - 98560*a^6*b^5*c^4 - 8960*a^6*b^6*c^3 + 38400*a^6*
b^7*c^2 - 51456*a^7*b^2*c^6 + 124416*a^7*b^3*c^5 + 58880*a^7*b^4*c^4 - 1024
00*a^7*b^5*c^3 - 6400*a^7*b^6*c^2 - 111168*a^8*b^2*c^5 + 144000*a^8*b^3*c^4
 + 44800*a^8*b^4*c^3 - 48000*a^8*b^5*c^2 - 94400*a^9*b^2*c^4 + 83200*a^9*b^
3*c^3 + 17920*a^9*b^4*c^2 - 45696*a^10*b^2*c^3 + 26112*a^10*b^3*c^2 - 12672
*a^11*b^2*c^2 + 512*a*b*c^13 - 512*a^13*b*c) - 608*a*b^2*c^11 + 2624*a*b^3*
c^10 + 224*a*b^4*c^9 - 6208*a*b^5*c^8 + 2112*a*b^6*c^7 + 6784*a*b^7*c^6 - 3
520*a*b^8*c^5 - 3584*a*b^9*c^4 + 2080*a*b^10*c^3 + 832*a*b^11*c^2 - 3840*a^
2*b*c^11 + 992*a^2*b^11*c - 17280*a^3*b*c^10 + 992*a^3*b^10*c - 46080*a^4*b
*c^9 - 3136*a^4*b^9*c - 80640*a^5*b*c^8 - 320*a^5*b^8*c - 96768*a^6*b*c^7 +
 3776*a^6*b^7*c - 80640*a^7*b*c^6 - 832*a^7*b^6*c - 46080*a^8*b*c^5 - 1952*
a^8*b^5*c - 17280*a^9*b*c^4 + 736*a^9*b^4*c - 3840*a^10*b*c^3 + 352*a^10*b^
3*c - 384*a^11*b*c^2 - 160*a^11*b^2*c - 4192*a^2*b^2*c^10 + 17888*a^2*b^3*c
^9 + 288*a^2*b^4*c^8 - 30080*a^2*b^5*c^7 + 8768*a^2*b^6*c^6 + 22848*a^2*b^7
*c^5 - 8768*a^2*b^8*c^4 - 7808*a^2*b^9*c^3 + 2592*a^2*b^10*c^2 - 15648*a^3*
b^2*c^9 + 60160*a^3*b^3*c^8 + 1152*a^3*b^4*c^7 - 73472*a^3*b^5*c^6 + 15424*
a^3*b^6*c^5 + 37888*a^3*b^7*c^4 - 8960*a^3*b^8*c^3 - 7552*a^3*b^9*c^2 - 366
72*a^4*b^2*c^8 + 120512*a^4*b^3*c^7 + 5376*a^4*b^4*c^6 - 104384*a^4*b^5*c^5
 + 12800*a^4*b^6*c^4 + 34112*a^4*b^7*c^3 - 3712*a^4*b^8*c^2 - 57792*a^5*b^2
*c^7 + 155008*a^5*b^3*c^6 + 12096*a^5*b^4*c^5 - 90496*a^5*b^5*c^4 + 3776*a^
5*b^6*c^3 + 16512*a^5*b^7*c^2 - 63168*a^6*b^2*c^6 + 131264*a^6*b^3*c^5 + 14
784*a^6*b^4*c^4 - 47488*a^6*b^5*c^3 - 1088*a^6*b^6*c^2 - 48192*a^7*b^2*c^5
+ 72448*a^7*b^3*c^4 + 10368*a^7*b^4*c^3 - 14080*a^7*b^5*c^2 - 25248*a^8*b^2
```

*c^4 + 24800*a^8*b^3*c^3 + 4032*a^8*b^4*c^2 - 8672*a^9*b^2*c^3 + 4672*a^9*b
^3*c^2 - 1760*a^10*b^2*c^2 - 384*a*b*c^12 - 416*a*b^12*c) - tan(x/2)*(32*a*
b^12 - 512*a*c^12 + 128*b*c^12 + 96*b^12*c - 32*b^13 - 64*c^13 + 96*a^2*b^1
1 - 96*a^3*b^10 - 96*a^4*b^9 + 96*a^5*b^8 + 32*a^6*b^7 - 32*a^7*b^6 - 1728*
a^2*c^11 - 3072*a^3*c^10 - 2688*a^4*c^9 + 2688*a^6*c^7 + 3072*a^7*c^6 + 172
8*a^8*c^5 + 512*a^9*c^4 + 64*a^10*c^3 + 160*b^2*c^11 - 544*b^3*c^10 + 64*b^
4*c^9 + 896*b^5*c^8 - 608*b^6*c^7 - 672*b^7*c^6 + 800*b^8*c^5 + 160*b^9*c^4
 - 448*b^10*c^3 + 64*b^11*c^2 + 480*a*b^2*c^10 - 4352*a*b^3*c^9 + 2560*a*b^
4*c^8 + 5248*a*b^5*c^7 - 5664*a*b^6*c^6 - 2240*a*b^7*c^5 + 4320*a*b^8*c^4 -
 256*a*b^9*c^3 - 1216*a*b^10*c^2 + 5632*a^2*b*c^10 - 672*a^2*b^10*c + 14336
*a^3*b*c^9 - 768*a^3*b^9*c + 23296*a^4*b*c^8 + 1248*a^4*b^8*c + 25088*a^5*b
*c^7 + 576*a^5*b^7*c + 17920*a^6*b*c^6 - 864*a^6*b^6*c + 8192*a^7*b*c^5 - 1
28*a^7*b^5*c + 2176*a^8*b*c^4 + 192*a^8*b^4*c + 256*a^9*b*c^3 - 1408*a^2*b^
2*c^9 - 14720*a^2*b^3*c^8 + 13440*a^2*b^4*c^7 + 11904*a^2*b^5*c^6 - 16800*a
^2*b^6*c^5 - 1696*a^2*b^7*c^4 + 7168*a^2*b^8*c^3 - 1216*a^2*b^9*c^2 - 9856*
a^3*b^2*c^8 - 27392*a^3*b^3*c^7 + 31232*a^3*b^4*c^6 + 12928*a^3*b^5*c^5 - 2
3264*a^3*b^6*c^4 + 1152*a^3*b^7*c^3 + 4800*a^3*b^8*c^2 - 22848*a^4*b^2*c^7
- 30400*a^4*b^3*c^6 + 39680*a^4*b^4*c^5 + 6272*a^4*b^5*c^4 - 16544*a^4*b^6*
c^3 + 1824*a^4*b^7*c^2 - 29120*a^5*b^2*c^6 - 20224*a^5*b^3*c^5 + 29184*a^5*
b^4*c^4 + 384*a^5*b^5*c^3 - 5856*a^5*b^6*c^2 - 22400*a^6*b^2*c^5 - 7552*a^6
*b^3*c^4 + 12160*a^6*b^4*c^3 - 640*a^6*b^5*c^2 - 10368*a^7*b^2*c^4 - 1280*a
^7*b^3*c^3 + 2560*a^7*b^4*c^2 - 2656*a^8*b^2*c^3 - 32*a^8*b^3*c^2 - 288*a^9
*b^2*c^2 + 1280*a*b*c^11 + 320*a*b^11*c))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 2
4*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^
4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1
/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c
 - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*
b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*
a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^
6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c
^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c +
 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6
*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^
2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2) + 1792*a^2*c^10
+ 3584*a^3*c^9 + 4480*a^4*c^8 + 3584*a^5*c^7 + 1792*a^6*c^6 + 512*a^7*c^5 +
 64*a^8*c^4 - 320*b^2*c^10 + 64*b^3*c^9 + 576*b^4*c^8 - 192*b^5*c^7 - 448*b
^6*c^6 + 192*b^7*c^5 + 128*b^8*c^4 - 64*b^9*c^3 - 1984*a*b^2*c^9 + 384*a*b^
3*c^8 + 2496*a*b^4*c^7 - 768*a*b^5*c^6 - 1088*a*b^6*c^5 + 384*a*b^7*c^4 + 6
4*a*b^8*c^3 - 5184*a^2*b^2*c^8 + 960*a^2*b^3*c^7 + 4224*a^2*b^4*c^6 - 1152*
a^2*b^5*c^5 - 832*a^2*b^6*c^4 + 192*a^2*b^7*c^3 - 7360*a^3*b^2*c^7 + 1280*a
^3*b^3*c^6 + 3456*a^3*b^4*c^5 - 768*a^3*b^5*c^4 - 192*a^3*b^6*c^3 - 6080*a^
4*b^2*c^6 + 960*a^4*b^3*c^5 + 1344*a^4*b^4*c^4 - 192*a^4*b^5*c^3 - 2880*a^5
*b^2*c^5 + 384*a^5*b^3*c^4 + 192*a^5*b^4*c^3 - 704*a^6*b^2*c^4 + 64*a^6*b^3
*c^3 - 64*a^7*b^2*c^3))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*
c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18

```
*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c
^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) -
 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b
^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3
*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 +
240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8
*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*
a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2
*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^
3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*2i + atan((((-(8*a*c^7 + b^8 + 24*
a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6
 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c -
 b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c
^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(
1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1
/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 +
 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^
6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*
a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 -
 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159
*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(128*
a*c^13 - 64*a*b^13 - 32*b^13*c + 32*b^14 - 96*a^2*b^12 + 256*a^3*b^11 + 64*
a^4*b^10 - 384*a^5*b^9 + 64*a^6*b^8 + 256*a^7*b^7 - 96*a^8*b^6 - 64*a^9*b^5
 + 32*a^10*b^4 + 1408*a^2*c^12 + 7040*a^3*c^11 + 21120*a^4*c^10 + 42240*a^5
*c^9 + 59136*a^6*c^8 + 59136*a^7*c^7 + 42240*a^8*c^6 + 21120*a^9*c^5 + 7040
*a^10*c^4 + 1408*a^11*c^3 + 128*a^12*c^2 - 32*b^2*c^12 + 96*b^3*c^11 + 64*b
^4*c^10 - 416*b^5*c^9 + 96*b^6*c^8 + 704*b^7*c^7 - 384*b^8*c^6 - 576*b^9*c^
5 + 416*b^10*c^4 + 224*b^11*c^3 - 192*b^12*c^2 + tan(x/2)*(-(8*a*c^7 + b^8
+ 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^
2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*
a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*
b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)
^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^
3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*
c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b
^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3
- 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*
c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4
+ 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*
(64*a*b^14 - 256*a*c^14 + 256*a^14*c - 64*b^14*c - 128*a^2*b^13 - 256*a^3*b
^12 + 640*a^4*b^11 + 320*a^5*b^10 - 1280*a^6*b^9 + 1280*a^8*b^7 - 320*a^9*b
^6 - 640*a^10*b^5 + 256*a^11*b^4 + 128*a^12*b^3 - 64*a^13*b^2 - 2816*a^2*c^
13 - 13824*a^3*c^12 - 39424*a^4*c^11 - 70400*a^5*c^10 - 76032*a^6*c^9 - 337
92*a^7*c^8 + 33792*a^8*c^7 + 76032*a^9*c^6 + 70400*a^10*c^5 + 39424*a^11*c^
4 + 13824*a^12*c^3 + 2816*a^13*c^2 + 64*b^2*c^13 - 128*b^3*c^12 - 256*b^4*c
```

^11 + 640*b^5*c^10 + 320*b^6*c^9 - 1280*b^7*c^8 + 1280*b^9*c^6 - 320*b^10*c
^5 - 640*b^11*c^4 + 256*b^12*c^3 + 128*b^13*c^2 + 1728*a*b^2*c^12 - 3840*a*
b^3*c^11 - 3584*a*b^4*c^10 + 10240*a*b^5*c^9 + 2240*a*b^6*c^8 - 12800*a*b^7
*c^7 + 1280*a*b^8*c^6 + 7680*a*b^9*c^5 - 1984*a*b^10*c^4 - 1792*a*b^11*c^3
+ 512*a*b^12*c^2 + 5120*a^2*b*c^12 - 512*a^2*b^12*c + 22528*a^3*b*c^11 + 17
92*a^3*b^11*c + 56320*a^4*b*c^10 + 1984*a^4*b^10*c + 84480*a^5*b*c^9 - 7680
*a^5*b^9*c + 67584*a^6*b*c^8 - 1280*a^6*b^8*c + 12800*a^7*b^7*c - 67584*a^8
*b*c^6 - 2240*a^8*b^6*c - 84480*a^9*b*c^5 - 10240*a^9*b^5*c - 56320*a^10*b*
c^4 + 3584*a^10*b^4*c - 22528*a^11*b*c^3 + 3840*a^11*b^3*c - 5120*a^12*b*c^
2 - 1728*a^12*b^2*c + 12672*a^2*b^2*c^11 - 26112*a^2*b^3*c^10 - 17920*a^2*b
^4*c^9 + 48000*a^2*b^5*c^8 + 6400*a^2*b^6*c^7 - 38400*a^2*b^7*c^6 + 3840*a^
2*b^8*c^5 + 11520*a^2*b^9*c^4 - 1664*a^2*b^10*c^3 + 45696*a^3*b^2*c^10 - 83
200*a^3*b^3*c^9 - 44800*a^3*b^4*c^8 + 102400*a^3*b^5*c^7 + 8960*a^3*b^6*c^6
 - 43520*a^3*b^7*c^5 + 2560*a^3*b^8*c^4 + 1664*a^3*b^10*c^2 + 94400*a^4*b^2
*c^9 - 144000*a^4*b^3*c^8 - 58880*a^4*b^4*c^7 + 98560*a^4*b^5*c^6 + 4480*a^
4*b^6*c^5 - 2560*a^4*b^8*c^3 - 11520*a^4*b^9*c^2 + 111168*a^5*b^2*c^8 - 124
416*a^5*b^3*c^7 - 28672*a^5*b^4*c^6 - 4480*a^5*b^6*c^4 + 43520*a^5*b^7*c^3
- 3840*a^5*b^8*c^2 + 51456*a^6*b^2*c^7 + 28672*a^6*b^4*c^5 - 98560*a^6*b^5*
c^4 - 8960*a^6*b^6*c^3 + 38400*a^6*b^7*c^2 - 51456*a^7*b^2*c^6 + 124416*a^7
*b^3*c^5 + 58880*a^7*b^4*c^4 - 102400*a^7*b^5*c^3 - 6400*a^7*b^6*c^2 - 1111
68*a^8*b^2*c^5 + 144000*a^8*b^3*c^4 + 44800*a^8*b^4*c^3 - 48000*a^8*b^5*c^2
 - 94400*a^9*b^2*c^4 + 83200*a^9*b^3*c^3 + 17920*a^9*b^4*c^2 - 45696*a^10*b
^2*c^3 + 26112*a^10*b^3*c^2 - 12672*a^11*b^2*c^2 + 512*a*b*c^13 - 512*a^13*
b*c) - 608*a*b^2*c^11 + 2624*a*b^3*c^10 + 224*a*b^4*c^9 - 6208*a*b^5*c^8 +
2112*a*b^6*c^7 + 6784*a*b^7*c^6 - 3520*a*b^8*c^5 - 3584*a*b^9*c^4 + 2080*a*
b^10*c^3 + 832*a*b^11*c^2 - 3840*a^2*b*c^11 + 992*a^2*b^11*c - 17280*a^3*b*
c^10 + 992*a^3*b^10*c - 46080*a^4*b*c^9 - 3136*a^4*b^9*c - 80640*a^5*b*c^8
- 320*a^5*b^8*c - 96768*a^6*b*c^7 + 3776*a^6*b^7*c - 80640*a^7*b*c^6 - 832*
a^7*b^6*c - 46080*a^8*b*c^5 - 1952*a^8*b^5*c - 17280*a^9*b*c^4 + 736*a^9*b^
4*c - 3840*a^10*b*c^3 + 352*a^10*b^3*c - 384*a^11*b*c^2 - 160*a^11*b^2*c -
4192*a^2*b^2*c^10 + 17888*a^2*b^3*c^9 + 288*a^2*b^4*c^8 - 30080*a^2*b^5*c^7
 + 8768*a^2*b^6*c^6 + 22848*a^2*b^7*c^5 - 8768*a^2*b^8*c^4 - 7808*a^2*b^9*c
^3 + 2592*a^2*b^10*c^2 - 15648*a^3*b^2*c^9 + 60160*a^3*b^3*c^8 + 1152*a^3*b
^4*c^7 - 73472*a^3*b^5*c^6 + 15424*a^3*b^6*c^5 + 37888*a^3*b^7*c^4 - 8960*a
^3*b^8*c^3 - 7552*a^3*b^9*c^2 - 36672*a^4*b^2*c^8 + 120512*a^4*b^3*c^7 + 53
76*a^4*b^4*c^6 - 104384*a^4*b^5*c^5 + 12800*a^4*b^6*c^4 + 34112*a^4*b^7*c^3
 - 3712*a^4*b^8*c^2 - 57792*a^5*b^2*c^7 + 155008*a^5*b^3*c^6 + 12096*a^5*b^
4*c^5 - 90496*a^5*b^5*c^4 + 3776*a^5*b^6*c^3 + 16512*a^5*b^7*c^2 - 63168*a^
6*b^2*c^6 + 131264*a^6*b^3*c^5 + 14784*a^6*b^4*c^4 - 47488*a^6*b^5*c^3 - 10
88*a^6*b^6*c^2 - 48192*a^7*b^2*c^5 + 72448*a^7*b^3*c^4 + 10368*a^7*b^4*c^3
- 14080*a^7*b^5*c^2 - 25248*a^8*b^2*c^4 + 24800*a^8*b^3*c^3 + 4032*a^8*b^4*
c^2 - 8672*a^9*b^2*c^3 + 4672*a^9*b^3*c^2 - 1760*a^10*b^2*c^2 - 384*a*b*c^1
2 - 416*a*b^12*c) + tan(x/2)*(32*a*b^12 - 512*a*c^12 + 128*b*c^12 + 96*b^12
*c - 32*b^13 - 64*c^13 + 96*a^2*b^11 - 96*a^3*b^10 - 96*a^4*b^9 + 96*a^5*b^
8 + 32*a^6*b^7 - 32*a^7*b^6 - 1728*a^2*c^11 - 3072*a^3*c^10 - 2688*a^4*c^9

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+ 2688*a^6*c^7 + 3072*a^7*c^6 + 1728*a^8*c^5 + 512*a^9*c^4 + 64*a^10*c^3 +
160*b^2*c^11 - 544*b^3*c^10 + 64*b^4*c^9 + 896*b^5*c^8 - 608*b^6*c^7 - 672*
b^7*c^6 + 800*b^8*c^5 + 160*b^9*c^4 - 448*b^10*c^3 + 64*b^11*c^2 + 480*a*b^
2*c^10 - 4352*a*b^3*c^9 + 2560*a*b^4*c^8 + 5248*a*b^5*c^7 - 5664*a*b^6*c^6
- 2240*a*b^7*c^5 + 4320*a*b^8*c^4 - 256*a*b^9*c^3 - 1216*a*b^10*c^2 + 5632*
a^2*b*c^10 - 672*a^2*b^10*c + 14336*a^3*b*c^9 - 768*a^3*b^9*c + 23296*a^4*b
*c^8 + 1248*a^4*b^8*c + 25088*a^5*b*c^7 + 576*a^5*b^7*c + 17920*a^6*b*c^6 -
 864*a^6*b^6*c + 8192*a^7*b*c^5 - 128*a^7*b^5*c + 2176*a^8*b*c^4 + 192*a^8*
b^4*c + 256*a^9*b*c^3 - 1408*a^2*b^2*c^9 - 14720*a^2*b^3*c^8 + 13440*a^2*b^
4*c^7 + 11904*a^2*b^5*c^6 - 16800*a^2*b^6*c^5 - 1696*a^2*b^7*c^4 + 7168*a^2
*b^8*c^3 - 1216*a^2*b^9*c^2 - 9856*a^3*b^2*c^8 - 27392*a^3*b^3*c^7 + 31232*
a^3*b^4*c^6 + 12928*a^3*b^5*c^5 - 23264*a^3*b^6*c^4 + 1152*a^3*b^7*c^3 + 48
00*a^3*b^8*c^2 - 22848*a^4*b^2*c^7 - 30400*a^4*b^3*c^6 + 39680*a^4*b^4*c^5
+ 6272*a^4*b^5*c^4 - 16544*a^4*b^6*c^3 + 1824*a^4*b^7*c^2 - 29120*a^5*b^2*c
^6 - 20224*a^5*b^3*c^5 + 29184*a^5*b^4*c^4 + 384*a^5*b^5*c^3 - 5856*a^5*b^6
*c^2 - 22400*a^6*b^2*c^5 - 7552*a^6*b^3*c^4 + 12160*a^6*b^4*c^3 - 640*a^6*b
^5*c^2 - 10368*a^7*b^2*c^4 - 1280*a^7*b^3*c^3 + 2560*a^7*b^4*c^2 - 2656*a^8
*b^2*c^3 - 32*a^8*b^3*c^2 - 288*a^9*b^2*c^2 + 1280*a*b*c^11 + 320*a*b^11*c)
)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b
^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*
c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 -
38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*
c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3
*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 1
6*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c
^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*
c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2
*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3
 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 1
4*a*b^8*c)))^(1/2)*1i - ((-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4
*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 1
8*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*
c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2)
- 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c -
b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 -
3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 +
 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 -
8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8
*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^
2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c
^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(128*a*c^13 - 64*a*b^13 - 32*b^13
*c + 32*b^14 - 96*a^2*b^12 + 256*a^3*b^11 + 64*a^4*b^10 - 384*a^5*b^9 + 64*
a^6*b^8 + 256*a^7*b^7 - 96*a^8*b^6 - 64*a^9*b^5 + 32*a^10*b^4 + 1408*a^2*c^
12 + 7040*a^3*c^11 + 21120*a^4*c^10 + 42240*a^5*c^9 + 59136*a^6*c^8 + 59136
*a^7*c^7 + 42240*a^8*c^6 + 21120*a^9*c^5 + 7040*a^10*c^4 + 1408*a^11*c^3 +
```

128*a^12*c^2 - 32*b^2*c^12 + 96*b^3*c^11 + 64*b^4*c^10 - 416*b^5*c^9 + 96*b
^6*c^8 + 704*b^7*c^7 - 384*b^8*c^6 - 576*b^9*c^5 + 416*b^10*c^4 + 224*b^11*
c^3 - 192*b^12*c^2 - tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 +
8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^
2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2
*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(
1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a
*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^
10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*
c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c
^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*
c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a
^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*
b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(64*a*b^14 - 256*a*c^14 + 25
6*a^14*c - 64*b^14*c - 128*a^2*b^13 - 256*a^3*b^12 + 640*a^4*b^11 + 320*a^5
*b^10 - 1280*a^6*b^9 + 1280*a^8*b^7 - 320*a^9*b^6 - 640*a^10*b^5 + 256*a^11
*b^4 + 128*a^12*b^3 - 64*a^13*b^2 - 2816*a^2*c^13 - 13824*a^3*c^12 - 39424*
a^4*c^11 - 70400*a^5*c^10 - 76032*a^6*c^9 - 33792*a^7*c^8 + 33792*a^8*c^7 +
76032*a^9*c^6 + 70400*a^10*c^5 + 39424*a^11*c^4 + 13824*a^12*c^3 + 2816*a^
13*c^2 + 64*b^2*c^13 - 128*b^3*c^12 - 256*b^4*c^11 + 640*b^5*c^10 + 320*b^6
*c^9 - 1280*b^7*c^8 + 1280*b^9*c^6 - 320*b^10*c^5 - 640*b^11*c^4 + 256*b^12
*c^3 + 128*b^13*c^2 + 1728*a*b^2*c^12 - 3840*a*b^3*c^11 - 3584*a*b^4*c^10 +
10240*a*b^5*c^9 + 2240*a*b^6*c^8 - 12800*a*b^7*c^7 + 1280*a*b^8*c^6 + 7680
*a*b^9*c^5 - 1984*a*b^10*c^4 - 1792*a*b^11*c^3 + 512*a*b^12*c^2 + 5120*a^2*
b*c^12 - 512*a^2*b^12*c + 22528*a^3*b*c^11 + 1792*a^3*b^11*c + 56320*a^4*b*
c^10 + 1984*a^4*b^10*c + 84480*a^5*b*c^9 - 7680*a^5*b^9*c + 67584*a^6*b*c^8
- 1280*a^6*b^8*c + 12800*a^7*b^7*c - 67584*a^8*b*c^6 - 2240*a^8*b^6*c - 84
480*a^9*b*c^5 - 10240*a^9*b^5*c - 56320*a^10*b*c^4 + 3584*a^10*b^4*c - 2252
8*a^11*b*c^3 + 3840*a^11*b^3*c - 5120*a^12*b*c^2 - 1728*a^12*b^2*c + 12672*
a^2*b^2*c^11 - 26112*a^2*b^3*c^10 - 17920*a^2*b^4*c^9 + 48000*a^2*b^5*c^8 +
6400*a^2*b^6*c^7 - 38400*a^2*b^7*c^6 + 3840*a^2*b^8*c^5 + 11520*a^2*b^9*c^
4 - 1664*a^2*b^10*c^3 + 45696*a^3*b^2*c^10 - 83200*a^3*b^3*c^9 - 44800*a^3*
b^4*c^8 + 102400*a^3*b^5*c^7 + 8960*a^3*b^6*c^6 - 43520*a^3*b^7*c^5 + 2560*
a^3*b^8*c^4 + 1664*a^3*b^10*c^2 + 94400*a^4*b^2*c^9 - 144000*a^4*b^3*c^8 -
58880*a^4*b^4*c^7 + 98560*a^4*b^5*c^6 + 4480*a^4*b^6*c^5 - 2560*a^4*b^8*c^3
- 11520*a^4*b^9*c^2 + 111168*a^5*b^2*c^8 - 124416*a^5*b^3*c^7 - 28672*a^5*
b^4*c^6 - 4480*a^5*b^6*c^4 + 43520*a^5*b^7*c^3 - 3840*a^5*b^8*c^2 + 51456*a
^6*b^2*c^7 + 28672*a^6*b^4*c^5 - 98560*a^6*b^5*c^4 - 8960*a^6*b^6*c^3 + 384
00*a^6*b^7*c^2 - 51456*a^7*b^2*c^6 + 124416*a^7*b^3*c^5 + 58880*a^7*b^4*c^4
- 102400*a^7*b^5*c^3 - 6400*a^7*b^6*c^2 - 111168*a^8*b^2*c^5 + 144000*a^8*
b^3*c^4 + 44800*a^8*b^4*c^3 - 48000*a^8*b^5*c^2 - 94400*a^9*b^2*c^4 + 83200
*a^9*b^3*c^3 + 17920*a^9*b^4*c^2 - 45696*a^10*b^2*c^3 + 26112*a^10*b^3*c^2
- 12672*a^11*b^2*c^2 + 512*a*b*c^13 - 512*a^13*b*c) - 608*a*b^2*c^11 + 2624
*a*b^3*c^10 + 224*a*b^4*c^9 - 6208*a*b^5*c^8 + 2112*a*b^6*c^7 + 6784*a*b^7*
c^6 - 3520*a*b^8*c^5 - 3584*a*b^9*c^4 + 2080*a*b^10*c^3 + 832*a*b^11*c^2 -

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3840*a^2*b*c^11 + 992*a^2*b^11*c - 17280*a^3*b*c^10 + 992*a^3*b^10*c - 4608
0*a^4*b*c^9 - 3136*a^4*b^9*c - 80640*a^5*b*c^8 - 320*a^5*b^8*c - 96768*a^6*
b*c^7 + 3776*a^6*b^7*c - 80640*a^7*b*c^6 - 832*a^7*b^6*c - 46080*a^8*b*c^5
- 1952*a^8*b^5*c - 17280*a^9*b*c^4 + 736*a^9*b^4*c - 3840*a^10*b*c^3 + 352*
a^10*b^3*c - 384*a^11*b*c^2 - 160*a^11*b^2*c - 4192*a^2*b^2*c^10 + 17888*a^
2*b^3*c^9 + 288*a^2*b^4*c^8 - 30080*a^2*b^5*c^7 + 8768*a^2*b^6*c^6 + 22848*
a^2*b^7*c^5 - 8768*a^2*b^8*c^4 - 7808*a^2*b^9*c^3 + 2592*a^2*b^10*c^2 - 156
48*a^3*b^2*c^9 + 60160*a^3*b^3*c^8 + 1152*a^3*b^4*c^7 - 73472*a^3*b^5*c^6 +
 15424*a^3*b^6*c^5 + 37888*a^3*b^7*c^4 - 8960*a^3*b^8*c^3 - 7552*a^3*b^9*c^
2 - 36672*a^4*b^2*c^8 + 120512*a^4*b^3*c^7 + 5376*a^4*b^4*c^6 - 104384*a^4*
b^5*c^5 + 12800*a^4*b^6*c^4 + 34112*a^4*b^7*c^3 - 3712*a^4*b^8*c^2 - 57792*
a^5*b^2*c^7 + 155008*a^5*b^3*c^6 + 12096*a^5*b^4*c^5 - 90496*a^5*b^5*c^4 +
3776*a^5*b^6*c^3 + 16512*a^5*b^7*c^2 - 63168*a^6*b^2*c^6 + 131264*a^6*b^3*c
^5 + 14784*a^6*b^4*c^4 - 47488*a^6*b^5*c^3 - 1088*a^6*b^6*c^2 - 48192*a^7*b
^2*c^5 + 72448*a^7*b^3*c^4 + 10368*a^7*b^4*c^3 - 14080*a^7*b^5*c^2 - 25248*
a^8*b^2*c^4 + 24800*a^8*b^3*c^3 + 4032*a^8*b^4*c^2 - 8672*a^9*b^2*c^3 + 467
2*a^9*b^3*c^2 - 1760*a^10*b^2*c^2 - 384*a*b*c^12 - 416*a*b^12*c) - tan(x/2)
*(32*a*b^12 - 512*a*c^12 + 128*b*c^12 + 96*b^12*c - 32*b^13 - 64*c^13 + 96*
a^2*b^11 - 96*a^3*b^10 - 96*a^4*b^9 + 96*a^5*b^8 + 32*a^6*b^7 - 32*a^7*b^6
- 1728*a^2*c^11 - 3072*a^3*c^10 - 2688*a^4*c^9 + 2688*a^6*c^7 + 3072*a^7*c^
6 + 1728*a^8*c^5 + 512*a^9*c^4 + 64*a^10*c^3 + 160*b^2*c^11 - 544*b^3*c^10
+ 64*b^4*c^9 + 896*b^5*c^8 - 608*b^6*c^7 - 672*b^7*c^6 + 800*b^8*c^5 + 160*
b^9*c^4 - 448*b^10*c^3 + 64*b^11*c^2 + 480*a*b^2*c^10 - 4352*a*b^3*c^9 + 25
60*a*b^4*c^8 + 5248*a*b^5*c^7 - 5664*a*b^6*c^6 - 2240*a*b^7*c^5 + 4320*a*b^
8*c^4 - 256*a*b^9*c^3 - 1216*a*b^10*c^2 + 5632*a^2*b*c^10 - 672*a^2*b^10*c
+ 14336*a^3*b*c^9 - 768*a^3*b^9*c + 23296*a^4*b*c^8 + 1248*a^4*b^8*c + 2508
8*a^5*b*c^7 + 576*a^5*b^7*c + 17920*a^6*b*c^6 - 864*a^6*b^6*c + 8192*a^7*b*
c^5 - 128*a^7*b^5*c + 2176*a^8*b*c^4 + 192*a^8*b^4*c + 256*a^9*b*c^3 - 1408
*a^2*b^2*c^9 - 14720*a^2*b^3*c^8 + 13440*a^2*b^4*c^7 + 11904*a^2*b^5*c^6 -
16800*a^2*b^6*c^5 - 1696*a^2*b^7*c^4 + 7168*a^2*b^8*c^3 - 1216*a^2*b^9*c^2
- 9856*a^3*b^2*c^8 - 27392*a^3*b^3*c^7 + 31232*a^3*b^4*c^6 + 12928*a^3*b^5*
c^5 - 23264*a^3*b^6*c^4 + 1152*a^3*b^7*c^3 + 4800*a^3*b^8*c^2 - 22848*a^4*b
^2*c^7 - 30400*a^4*b^3*c^6 + 39680*a^4*b^4*c^5 + 6272*a^4*b^5*c^4 - 16544*a
^4*b^6*c^3 + 1824*a^4*b^7*c^2 - 29120*a^5*b^2*c^6 - 20224*a^5*b^3*c^5 + 291
84*a^5*b^4*c^4 + 384*a^5*b^5*c^3 - 5856*a^5*b^6*c^2 - 22400*a^6*b^2*c^5 - 7
552*a^6*b^3*c^4 + 12160*a^6*b^4*c^3 - 640*a^6*b^5*c^2 - 10368*a^7*b^2*c^4 -
 1280*a^7*b^3*c^3 + 2560*a^7*b^4*c^2 - 2656*a^8*b^2*c^3 - 32*a^8*b^3*c^2 -
288*a^9*b^2*c^2 + 1280*a*b*c^11 + 320*a*b^11*c))*(-(8*a*c^7 + b^8 + 24*a^2*
c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3
*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2
)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(
-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2)
 - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))
/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240
*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 -
```

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3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*
b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*
a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4
*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*1i)/(512*
a*c^11 + 64*c^12 + ((-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4
- b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b
^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 +
 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*
a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^
3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4
*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*
a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b
^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*
b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5
 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 -
96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(128*a*c^13 - 64*a*b^13 - 32*b^13*c +
32*b^14 - 96*a^2*b^12 + 256*a^3*b^11 + 64*a^4*b^10 - 384*a^5*b^9 + 64*a^6*b
^8 + 256*a^7*b^7 - 96*a^8*b^6 - 64*a^9*b^5 + 32*a^10*b^4 + 1408*a^2*c^12 +
7040*a^3*c^11 + 21120*a^4*c^10 + 42240*a^5*c^9 + 59136*a^6*c^8 + 59136*a^7*
c^7 + 42240*a^8*c^6 + 21120*a^9*c^5 + 7040*a^10*c^4 + 1408*a^11*c^3 + 128*a
^12*c^2 - 32*b^2*c^12 + 96*b^3*c^11 + 64*b^4*c^10 - 416*b^5*c^9 + 96*b^6*c^
8 + 704*b^7*c^7 - 384*b^8*c^6 - 576*b^9*c^5 + 416*b^10*c^4 + 224*b^11*c^3 -
 192*b^12*c^2 + tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4
*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 1
8*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*
c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2)
- 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c -
b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 -
3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 +
 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 -
8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8
*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^
2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c
^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2)*(64*a*b^14 - 256*a*c^14 + 256*a^1
4*c - 64*b^14*c - 128*a^2*b^13 - 256*a^3*b^12 + 640*a^4*b^11 + 320*a^5*b^10
 - 1280*a^6*b^9 + 1280*a^8*b^7 - 320*a^9*b^6 - 640*a^10*b^5 + 256*a^11*b^4
+ 128*a^12*b^3 - 64*a^13*b^2 - 2816*a^2*c^13 - 13824*a^3*c^12 - 39424*a^4*c
^11 - 70400*a^5*c^10 - 76032*a^6*c^9 - 33792*a^7*c^8 + 33792*a^8*c^7 + 7603
2*a^9*c^6 + 70400*a^10*c^5 + 39424*a^11*c^4 + 13824*a^12*c^3 + 2816*a^13*c^
2 + 64*b^2*c^13 - 128*b^3*c^12 - 256*b^4*c^11 + 640*b^5*c^10 + 320*b^6*c^9
- 1280*b^7*c^8 + 1280*b^9*c^6 - 320*b^10*c^5 - 640*b^11*c^4 + 256*b^12*c^3
+ 128*b^13*c^2 + 1728*a*b^2*c^12 - 3840*a*b^3*c^11 - 3584*a*b^4*c^10 + 1024
0*a*b^5*c^9 + 2240*a*b^6*c^8 - 12800*a*b^7*c^7 + 1280*a*b^8*c^6 + 7680*a*b^
9*c^5 - 1984*a*b^10*c^4 - 1792*a*b^11*c^3 + 512*a*b^12*c^2 + 5120*a^2*b*c^1
2 - 512*a^2*b^12*c + 22528*a^3*b*c^11 + 1792*a^3*b^11*c + 56320*a^4*b*c^10
```

+ 1984*a^4*b^10*c + 84480*a^5*b*c^9 - 7680*a^5*b^9*c + 67584*a^6*b*c^8 - 12
80*a^6*b^8*c + 12800*a^7*b^7*c - 67584*a^8*b*c^6 - 2240*a^8*b^6*c - 84480*a
^9*b*c^5 - 10240*a^9*b^5*c - 56320*a^10*b*c^4 + 3584*a^10*b^4*c - 22528*a^1
1*b*c^3 + 3840*a^11*b^3*c - 5120*a^12*b*c^2 - 1728*a^12*b^2*c + 12672*a^2*b
^2*c^11 - 26112*a^2*b^3*c^10 - 17920*a^2*b^4*c^9 + 48000*a^2*b^5*c^8 + 6400
*a^2*b^6*c^7 - 38400*a^2*b^7*c^6 + 3840*a^2*b^8*c^5 + 11520*a^2*b^9*c^4 - 1
664*a^2*b^10*c^3 + 45696*a^3*b^2*c^10 - 83200*a^3*b^3*c^9 - 44800*a^3*b^4*c
^8 + 102400*a^3*b^5*c^7 + 8960*a^3*b^6*c^6 - 43520*a^3*b^7*c^5 + 2560*a^3*b
^8*c^4 + 1664*a^3*b^10*c^2 + 94400*a^4*b^2*c^9 - 144000*a^4*b^3*c^8 - 58880
*a^4*b^4*c^7 + 98560*a^4*b^5*c^6 + 4480*a^4*b^6*c^5 - 2560*a^4*b^8*c^3 - 11
520*a^4*b^9*c^2 + 111168*a^5*b^2*c^8 - 124416*a^5*b^3*c^7 - 28672*a^5*b^4*c
^6 - 4480*a^5*b^6*c^4 + 43520*a^5*b^7*c^3 - 3840*a^5*b^8*c^2 + 51456*a^6*b^
2*c^7 + 28672*a^6*b^4*c^5 - 98560*a^6*b^5*c^4 - 8960*a^6*b^6*c^3 + 38400*a^
6*b^7*c^2 - 51456*a^7*b^2*c^6 + 124416*a^7*b^3*c^5 + 58880*a^7*b^4*c^4 - 10
2400*a^7*b^5*c^3 - 6400*a^7*b^6*c^2 - 111168*a^8*b^2*c^5 + 144000*a^8*b^3*c
^4 + 44800*a^8*b^4*c^3 - 48000*a^8*b^5*c^2 - 94400*a^9*b^2*c^4 + 83200*a^9*
b^3*c^3 + 17920*a^9*b^4*c^2 - 45696*a^10*b^2*c^3 + 26112*a^10*b^3*c^2 - 126
72*a^11*b^2*c^2 + 512*a*b*c^13 - 512*a^13*b*c) - 608*a*b^2*c^11 + 2624*a*b^
3*c^10 + 224*a*b^4*c^9 - 6208*a*b^5*c^8 + 2112*a*b^6*c^7 + 6784*a*b^7*c^6 -
 3520*a*b^8*c^5 - 3584*a*b^9*c^4 + 2080*a*b^10*c^3 + 832*a*b^11*c^2 - 3840*
a^2*b*c^11 + 992*a^2*b^11*c - 17280*a^3*b*c^10 + 992*a^3*b^10*c - 46080*a^4
*b*c^9 - 3136*a^4*b^9*c - 80640*a^5*b*c^8 - 320*a^5*b^8*c - 96768*a^6*b*c^7
 + 3776*a^6*b^7*c - 80640*a^7*b*c^6 - 832*a^7*b^6*c - 46080*a^8*b*c^5 - 195
2*a^8*b^5*c - 17280*a^9*b*c^4 + 736*a^9*b^4*c - 3840*a^10*b*c^3 + 352*a^10*
b^3*c - 384*a^11*b*c^2 - 160*a^11*b^2*c - 4192*a^2*b^2*c^10 + 17888*a^2*b^3
*c^9 + 288*a^2*b^4*c^8 - 30080*a^2*b^5*c^7 + 8768*a^2*b^6*c^6 + 22848*a^2*b
^7*c^5 - 8768*a^2*b^8*c^4 - 7808*a^2*b^9*c^3 + 2592*a^2*b^10*c^2 - 15648*a^
3*b^2*c^9 + 60160*a^3*b^3*c^8 + 1152*a^3*b^4*c^7 - 73472*a^3*b^5*c^6 + 1542
4*a^3*b^6*c^5 + 37888*a^3*b^7*c^4 - 8960*a^3*b^8*c^3 - 7552*a^3*b^9*c^2 - 3
6672*a^4*b^2*c^8 + 120512*a^4*b^3*c^7 + 5376*a^4*b^4*c^6 - 104384*a^4*b^5*c
^5 + 12800*a^4*b^6*c^4 + 34112*a^4*b^7*c^3 - 3712*a^4*b^8*c^2 - 57792*a^5*b
^2*c^7 + 155008*a^5*b^3*c^6 + 12096*a^5*b^4*c^5 - 90496*a^5*b^5*c^4 + 3776*
a^5*b^6*c^3 + 16512*a^5*b^7*c^2 - 63168*a^6*b^2*c^6 + 131264*a^6*b^3*c^5 +
14784*a^6*b^4*c^4 - 47488*a^6*b^5*c^3 - 1088*a^6*b^6*c^2 - 48192*a^7*b^2*c^
5 + 72448*a^7*b^3*c^4 + 10368*a^7*b^4*c^3 - 14080*a^7*b^5*c^2 - 25248*a^8*b
^2*c^4 + 24800*a^8*b^3*c^3 + 4032*a^8*b^4*c^2 - 8672*a^9*b^2*c^3 + 4672*a^9
*b^3*c^2 - 1760*a^10*b^2*c^2 - 384*a*b*c^12 - 416*a*b^12*c) + tan(x/2)*(32*
a*b^12 - 512*a*c^12 + 128*b*c^12 + 96*b^12*c - 32*b^13 - 64*c^13 + 96*a^2*b
^11 - 96*a^3*b^10 - 96*a^4*b^9 + 96*a^5*b^8 + 32*a^6*b^7 - 32*a^7*b^6 - 172
8*a^2*c^11 - 3072*a^3*c^10 - 2688*a^4*c^9 + 2688*a^6*c^7 + 3072*a^7*c^6 + 1
728*a^8*c^5 + 512*a^9*c^4 + 64*a^10*c^3 + 160*b^2*c^11 - 544*b^3*c^10 + 64*
b^4*c^9 + 896*b^5*c^8 - 608*b^6*c^7 - 672*b^7*c^6 + 800*b^8*c^5 + 160*b^9*c
^4 - 448*b^10*c^3 + 64*b^11*c^2 + 480*a*b^2*c^10 - 4352*a*b^3*c^9 + 2560*a*
b^4*c^8 + 5248*a*b^5*c^7 - 5664*a*b^6*c^6 - 2240*a*b^7*c^5 + 4320*a*b^8*c^4
 - 256*a*b^9*c^3 - 1216*a*b^10*c^2 + 5632*a^2*b*c^10 - 672*a^2*b^10*c + 143

36*a^3*b*c^9 - 768*a^3*b^9*c + 23296*a^4*b*c^8 + 1248*a^4*b^8*c + 25088*a^5
*b*c^7 + 576*a^5*b^7*c + 17920*a^6*b*c^6 - 864*a^6*b^6*c + 8192*a^7*b*c^5 -
128*a^7*b^5*c + 2176*a^8*b*c^4 + 192*a^8*b^4*c + 256*a^9*b*c^3 - 1408*a^2*
b^2*c^9 - 14720*a^2*b^3*c^8 + 13440*a^2*b^4*c^7 + 11904*a^2*b^5*c^6 - 16800
*a^2*b^6*c^5 - 1696*a^2*b^7*c^4 + 7168*a^2*b^8*c^3 - 1216*a^2*b^9*c^2 - 985
6*a^3*b^2*c^8 - 27392*a^3*b^3*c^7 + 31232*a^3*b^4*c^6 + 12928*a^3*b^5*c^5 -
23264*a^3*b^6*c^4 + 1152*a^3*b^7*c^3 + 4800*a^3*b^8*c^2 - 22848*a^4*b^2*c^
7 - 30400*a^4*b^3*c^6 + 39680*a^4*b^4*c^5 + 6272*a^4*b^5*c^4 - 16544*a^4*b^
6*c^3 + 1824*a^4*b^7*c^2 - 29120*a^5*b^2*c^6 - 20224*a^5*b^3*c^5 + 29184*a^
5*b^4*c^4 + 384*a^5*b^5*c^3 - 5856*a^5*b^6*c^2 - 22400*a^6*b^2*c^5 - 7552*a
^6*b^3*c^4 + 12160*a^6*b^4*c^3 - 640*a^6*b^5*c^2 - 10368*a^7*b^2*c^4 - 1280
*a^7*b^3*c^3 + 2560*a^7*b^4*c^2 - 2656*a^8*b^2*c^3 - 32*a^8*b^3*c^2 - 288*a
^9*b^2*c^2 + 1280*a*b*c^11 + 320*a*b^11*c))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 +
24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*
c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^
(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a
*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*
a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(
3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*
c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6
*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c
+ 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b
^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*
c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^(1/2) + ((-(8*a*c^7
+ b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2)
- 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4
*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^
3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c -
b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 9
6*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c
^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^
6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^
2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^
2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c)))^
(1/2)*(128*a*c^13 - 64*a*b^13 - 32*b^13*c + 32*b^14 - 96*a^2*b^12 + 256*a^3
*b^11 + 64*a^4*b^10 - 384*a^5*b^9 + 64*a^6*b^8 + 256*a^7*b^7 - 96*a^8*b^6 -
64*a^9*b^5 + 32*a^10*b^4 + 1408*a^2*c^12 + 7040*a^3*c^11 + 21120*a^4*c^10
+ 42240*a^5*c^9 + 59136*a^6*c^8 + 59136*a^7*c^7 + 42240*a^8*c^6 + 21120*a^9
*c^5 + 7040*a^10*c^4 + 1408*a^11*c^3 + 128*a^12*c^2 - 32*b^2*c^12 + 96*b^3*
c^11 + 64*b^4*c^10 - 416*b^5*c^9 + 96*b^6*c^8 + 704*b^7*c^7 - 384*b^8*c^6 -
576*b^9*c^5 + 416*b^10*c^4 + 224*b^11*c^3 - 192*b^12*c^2 - tan(x/2)*(-(8*a
*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(
1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*
b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b

^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4
*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*
a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^
8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*
a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36
*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 1
59*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a
^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*
c)))^(1/2)*(64*a*b^14 - 256*a*c^14 + 256*a^14*c - 64*b^14*c - 128*a^2*b^13
- 256*a^3*b^12 + 640*a^4*b^11 + 320*a^5*b^10 - 1280*a^6*b^9 + 1280*a^8*b^7
- 320*a^9*b^6 - 640*a^10*b^5 + 256*a^11*b^4 + 128*a^12*b^3 - 64*a^13*b^2 -
2816*a^2*c^13 - 13824*a^3*c^12 - 39424*a^4*c^11 - 70400*a^5*c^10 - 76032*a^
6*c^9 - 33792*a^7*c^8 + 33792*a^8*c^7 + 76032*a^9*c^6 + 70400*a^10*c^5 + 39
424*a^11*c^4 + 13824*a^12*c^3 + 2816*a^13*c^2 + 64*b^2*c^13 - 128*b^3*c^12
- 256*b^4*c^11 + 640*b^5*c^10 + 320*b^6*c^9 - 1280*b^7*c^8 + 1280*b^9*c^6 -
320*b^10*c^5 - 640*b^11*c^4 + 256*b^12*c^3 + 128*b^13*c^2 + 1728*a*b^2*c^1
2 - 3840*a*b^3*c^11 - 3584*a*b^4*c^10 + 10240*a*b^5*c^9 + 2240*a*b^6*c^8 -
12800*a*b^7*c^7 + 1280*a*b^8*c^6 + 7680*a*b^9*c^5 - 1984*a*b^10*c^4 - 1792*
a*b^11*c^3 + 512*a*b^12*c^2 + 5120*a^2*b*c^12 - 512*a^2*b^12*c + 22528*a^3*
b*c^11 + 1792*a^3*b^11*c + 56320*a^4*b*c^10 + 1984*a^4*b^10*c + 84480*a^5*b
*c^9 - 7680*a^5*b^9*c + 67584*a^6*b*c^8 - 1280*a^6*b^8*c + 12800*a^7*b^7*c
- 67584*a^8*b*c^6 - 2240*a^8*b^6*c - 84480*a^9*b*c^5 - 10240*a^9*b^5*c - 56
320*a^10*b*c^4 + 3584*a^10*b^4*c - 22528*a^11*b*c^3 + 3840*a^11*b^3*c - 512
0*a^12*b*c^2 - 1728*a^12*b^2*c + 12672*a^2*b^2*c^11 - 26112*a^2*b^3*c^10 -
17920*a^2*b^4*c^9 + 48000*a^2*b^5*c^8 + 6400*a^2*b^6*c^7 - 38400*a^2*b^7*c^
6 + 3840*a^2*b^8*c^5 + 11520*a^2*b^9*c^4 - 1664*a^2*b^10*c^3 + 45696*a^3*b^
2*c^10 - 83200*a^3*b^3*c^9 - 44800*a^3*b^4*c^8 + 102400*a^3*b^5*c^7 + 8960*
a^3*b^6*c^6 - 43520*a^3*b^7*c^5 + 2560*a^3*b^8*c^4 + 1664*a^3*b^10*c^2 + 94
400*a^4*b^2*c^9 - 144000*a^4*b^3*c^8 - 58880*a^4*b^4*c^7 + 98560*a^4*b^5*c^
6 + 4480*a^4*b^6*c^5 - 2560*a^4*b^8*c^3 - 11520*a^4*b^9*c^2 + 111168*a^5*b^
2*c^8 - 124416*a^5*b^3*c^7 - 28672*a^5*b^4*c^6 - 4480*a^5*b^6*c^4 + 43520*a
^5*b^7*c^3 - 3840*a^5*b^8*c^2 + 51456*a^6*b^2*c^7 + 28672*a^6*b^4*c^5 - 985
60*a^6*b^5*c^4 - 8960*a^6*b^6*c^3 + 38400*a^6*b^7*c^2 - 51456*a^7*b^2*c^6 +
124416*a^7*b^3*c^5 + 58880*a^7*b^4*c^4 - 102400*a^7*b^5*c^3 - 6400*a^7*b^6
*c^2 - 111168*a^8*b^2*c^5 + 144000*a^8*b^3*c^4 + 44800*a^8*b^4*c^3 - 48000*
a^8*b^5*c^2 - 94400*a^9*b^2*c^4 + 83200*a^9*b^3*c^3 + 17920*a^9*b^4*c^2 - 4
5696*a^10*b^2*c^3 + 26112*a^10*b^3*c^2 - 12672*a^11*b^2*c^2 + 512*a*b*c^13
- 512*a^13*b*c) - 608*a*b^2*c^11 + 2624*a*b^3*c^10 + 224*a*b^4*c^9 - 6208*a
*b^5*c^8 + 2112*a*b^6*c^7 + 6784*a*b^7*c^6 - 3520*a*b^8*c^5 - 3584*a*b^9*c^
4 + 2080*a*b^10*c^3 + 832*a*b^11*c^2 - 3840*a^2*b*c^11 + 992*a^2*b^11*c - 1
7280*a^3*b*c^10 + 992*a^3*b^10*c - 46080*a^4*b*c^9 - 3136*a^4*b^9*c - 80640
*a^5*b*c^8 - 320*a^5*b^8*c - 96768*a^6*b*c^7 + 3776*a^6*b^7*c - 80640*a^7*b
*c^6 - 832*a^7*b^6*c - 46080*a^8*b*c^5 - 1952*a^8*b^5*c - 17280*a^9*b*c^4 +
736*a^9*b^4*c - 3840*a^10*b*c^3 + 352*a^10*b^3*c - 384*a^11*b*c^2 - 160*a^
11*b^2*c - 4192*a^2*b^2*c^10 + 17888*a^2*b^3*c^9 + 288*a^2*b^4*c^8 - 30080*

a^2*b^5*c^7 + 8768*a^2*b^6*c^6 + 22848*a^2*b^7*c^5 - 8768*a^2*b^8*c^4 - 780
8*a^2*b^9*c^3 + 2592*a^2*b^10*c^2 - 15648*a^3*b^2*c^9 + 60160*a^3*b^3*c^8 +
1152*a^3*b^4*c^7 - 73472*a^3*b^5*c^6 + 15424*a^3*b^6*c^5 + 37888*a^3*b^7*c
^4 - 8960*a^3*b^8*c^3 - 7552*a^3*b^9*c^2 - 36672*a^4*b^2*c^8 + 120512*a^4*b
^3*c^7 + 5376*a^4*b^4*c^6 - 104384*a^4*b^5*c^5 + 12800*a^4*b^6*c^4 + 34112*
a^4*b^7*c^3 - 3712*a^4*b^8*c^2 - 57792*a^5*b^2*c^7 + 155008*a^5*b^3*c^6 + 1
2096*a^5*b^4*c^5 - 90496*a^5*b^5*c^4 + 3776*a^5*b^6*c^3 + 16512*a^5*b^7*c^2
- 63168*a^6*b^2*c^6 + 131264*a^6*b^3*c^5 + 14784*a^6*b^4*c^4 - 47488*a^6*b
^5*c^3 - 1088*a^6*b^6*c^2 - 48192*a^7*b^2*c^5 + 72448*a^7*b^3*c^4 + 10368*a
^7*b^4*c^3 - 14080*a^7*b^5*c^2 - 25248*a^8*b^2*c^4 + 24800*a^8*b^3*c^3 + 40
32*a^8*b^4*c^2 - 8672*a^9*b^2*c^3 + 4672*a^9*b^3*c^2 - 1760*a^10*b^2*c^2 -
384*a*b*c^12 - 416*a*b^12*c) - tan(x/2)*(32*a*b^12 - 512*a*c^12 + 128*b*c^1
2 + 96*b^12*c - 32*b^13 - 64*c^13 + 96*a^2*b^11 - 96*a^3*b^10 - 96*a^4*b^9
+ 96*a^5*b^8 + 32*a^6*b^7 - 32*a^7*b^6 - 1728*a^2*c^11 - 3072*a^3*c^10 - 26
88*a^4*c^9 + 2688*a^6*c^7 + 3072*a^7*c^6 + 1728*a^8*c^5 + 512*a^9*c^4 + 64*
a^10*c^3 + 160*b^2*c^11 - 544*b^3*c^10 + 64*b^4*c^9 + 896*b^5*c^8 - 608*b^6
*c^7 - 672*b^7*c^6 + 800*b^8*c^5 + 160*b^9*c^4 - 448*b^10*c^3 + 64*b^11*c^2
+ 480*a*b^2*c^10 - 4352*a*b^3*c^9 + 2560*a*b^4*c^8 + 5248*a*b^5*c^7 - 5664
*a*b^6*c^6 - 2240*a*b^7*c^5 + 4320*a*b^8*c^4 - 256*a*b^9*c^3 - 1216*a*b^10*
c^2 + 5632*a^2*b*c^10 - 672*a^2*b^10*c + 14336*a^3*b*c^9 - 768*a^3*b^9*c +
23296*a^4*b*c^8 + 1248*a^4*b^8*c + 25088*a^5*b*c^7 + 576*a^5*b^7*c + 17920*
a^6*b*c^6 - 864*a^6*b^6*c + 8192*a^7*b*c^5 - 128*a^7*b^5*c + 2176*a^8*b*c^4
+ 192*a^8*b^4*c + 256*a^9*b*c^3 - 1408*a^2*b^2*c^9 - 14720*a^2*b^3*c^8 + 1
3440*a^2*b^4*c^7 + 11904*a^2*b^5*c^6 - 16800*a^2*b^6*c^5 - 1696*a^2*b^7*c^4
+ 7168*a^2*b^8*c^3 - 1216*a^2*b^9*c^2 - 9856*a^3*b^2*c^8 - 27392*a^3*b^3*c
^7 + 31232*a^3*b^4*c^6 + 12928*a^3*b^5*c^5 - 23264*a^3*b^6*c^4 + 1152*a^3*b
^7*c^3 + 4800*a^3*b^8*c^2 - 22848*a^4*b^2*c^7 - 30400*a^4*b^3*c^6 + 39680*a
^4*b^4*c^5 + 6272*a^4*b^5*c^4 - 16544*a^4*b^6*c^3 + 1824*a^4*b^7*c^2 - 2912
0*a^5*b^2*c^6 - 20224*a^5*b^3*c^5 + 29184*a^5*b^4*c^4 + 384*a^5*b^5*c^3 - 5
856*a^5*b^6*c^2 - 22400*a^6*b^2*c^5 - 7552*a^6*b^3*c^4 + 12160*a^6*b^4*c^3
- 640*a^6*b^5*c^2 - 10368*a^7*b^2*c^4 - 1280*a^7*b^3*c^3 + 2560*a^7*b^4*c^2
- 2656*a^8*b^2*c^3 - 32*a^8*b^3*c^2 - 288*a^9*b^2*c^2 + 1280*a*b*c^11 + 32
0*a*b^11*c))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(
-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5
+ 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2
*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c
- 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2
) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 +
a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4
+ 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7
+ 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c -
96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*
a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*
b^2*c^2 + 14*a*b^8*c)))^(1/2) + 1792*a^2*c^10 + 3584*a^3*c^9 + 4480*a^4*c^8
+ 3584*a^5*c^7 + 1792*a^6*c^6 + 512*a^7*c^5 + 64*a^8*c^4 - 320*b^2*c^10 +

```
64*b^3*c^9 + 576*b^4*c^8 - 192*b^5*c^7 - 448*b^6*c^6 + 192*b^7*c^5 + 128*b^
8*c^4 - 64*b^9*c^3 - 1984*a*b^2*c^9 + 384*a*b^3*c^8 + 2496*a*b^4*c^7 - 768*
a*b^5*c^6 - 1088*a*b^6*c^5 + 384*a*b^7*c^4 + 64*a*b^8*c^3 - 5184*a^2*b^2*c^
8 + 960*a^2*b^3*c^7 + 4224*a^2*b^4*c^6 - 1152*a^2*b^5*c^5 - 832*a^2*b^6*c^4
 + 192*a^2*b^7*c^3 - 7360*a^3*b^2*c^7 + 1280*a^3*b^3*c^6 + 3456*a^3*b^4*c^5
 - 768*a^3*b^5*c^4 - 192*a^3*b^6*c^3 - 6080*a^4*b^2*c^6 + 960*a^4*b^3*c^5 +
 1344*a^4*b^4*c^4 - 192*a^4*b^5*c^3 - 2880*a^5*b^2*c^5 + 384*a^5*b^3*c^4 +
192*a^5*b^4*c^3 - 704*a^6*b^2*c^4 + 64*a^6*b^3*c^3 - 64*a^7*b^2*c^3))*(-(8*
a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^
(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3
*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*
b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(
4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4
*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c
^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16
*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 3
6*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 +
159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*
a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8
*c)))^(1/2)*2i + tan(x/2)/(2*a - 2*b + 2*c) - (a - b + c)/(tan(x/2)*(a + b
+ c)*(2*a - 2*b + 2*c))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\csc^2(x)}{a + b\cos(x) + c\cos^2(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(csc(x)**2/(a+b*cos(x)+c*cos(x)**2),x)
[Out] Integral(csc(x)**2/(a + b*cos(x) + c*cos(x)**2), x)
```

3.9 $\int \frac{\sin(x)}{-2+\cos(x)+\cos^2(x)}\,dx$

Optimal. Leaf size=21

$$\frac{1}{3}\log(\cos(x)+2)-\frac{1}{3}\log(1-\cos(x))$$

```
[Out] -1/3*ln(1-cos(x))+1/3*ln(2+cos(x))
```

Rubi [A] time = 0.02, antiderivative size = 21, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {3259, 616, 31}

$$\frac{1}{3}\log(\cos(x)+2)-\frac{1}{3}\log(1-\cos(x))$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]/(-2 + Cos[x] + Cos[x]^2),x]
```

```
[Out] -Log[1 - Cos[x]]/3 + Log[2 + Cos[x]]/3
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 616

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = Rt[b^2
 - 4*a*c, 2]}, Dist[c/q, Int[1/Simp[b/2 - q/2 + c*x, x], x], x] - Dist[c/q,
 Int[1/Simp[b/2 + q/2 + c*x, x], x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2
- 4*a*c, 0] && PosQ[b^2 - 4*a*c] && PerfectSquareQ[b^2 - 4*a*c]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$\int \frac{\sin(x)}{-2+\cos(x)+\cos^2(x)}\,dx = -\text{Subst}\left(\int \frac{1}{-2+x+x^2}\,dx, x, \cos(x)\right)$$
$$= -\left(\frac{1}{3}\text{Subst}\left(\int \frac{1}{-1+x}\,dx, x, \cos(x)\right)\right) + \frac{1}{3}\text{Subst}\left(\int \frac{1}{2+x}\,dx, x, \cos(x)\right)$$
$$= -\frac{1}{3}\log(1-\cos(x)) + \frac{1}{3}\log(2+\cos(x))$$

Mathematica [A] time = 0.03, size = 19, normalized size = 0.90

$$\frac{1}{3}\left(\log(\cos(x)+2) - 2\log\left(\sin\left(\frac{x}{2}\right)\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]/(-2 + Cos[x] + Cos[x]^2),x]
[Out] (Log[2 + Cos[x]] - 2*Log[Sin[x/2]])/3
```

fricas [A] time = 0.58, size = 17, normalized size = 0.81

$$\frac{1}{3}\,\log\left(\cos(x)+2\right) - \frac{1}{3}\,\log\left(-\frac{1}{2}\,\cos(x)+\frac{1}{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(-2+cos(x)+cos(x)^2),x, algorithm="fricas")
[Out] 1/3*log(cos(x) + 2) - 1/3*log(-1/2*cos(x) + 1/2)
```

giac [A] time = 0.30, size = 17, normalized size = 0.81

$$\frac{1}{3}\,\log\left(\cos(x)+2\right) - \frac{1}{3}\,\log\left(-\cos(x)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(-2+cos(x)+cos(x)^2),x, algorithm="giac")
[Out] 1/3*log(cos(x) + 2) - 1/3*log(-cos(x) + 1)
```

maple [A] time = 0.08, size = 16, normalized size = 0.76

$$\frac{\ln\left(2+\cos(x)\right)}{3} - \frac{\ln\left(-1+\cos(x)\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(-2+cos(x)+cos(x)^2),x)
```

```
[Out] 1/3*ln(2+cos(x))-1/3*ln(-1+cos(x))
```

maxima [A] time = 0.33, size = 15, normalized size = 0.71

$$\frac{1}{3}\log\left(\cos(x)+2\right)-\frac{1}{3}\log\left(\cos(x)-1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(-2+cos(x)+cos(x)^2),x, algorithm="maxima")
```

```
[Out] 1/3*log(cos(x) + 2) - 1/3*log(cos(x) - 1)
```

mupad [B] time = 0.16, size = 9, normalized size = 0.43

$$\frac{2\,\mathrm{atanh}\left(\frac{2\cos(x)}{3}+\frac{1}{3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(cos(x) + cos(x)^2 - 2),x)
```

```
[Out] (2*atanh((2*cos(x))/3 + 1/3))/3
```

sympy [A] time = 0.20, size = 15, normalized size = 0.71

$$-\frac{\log\left(\cos\left(x\right)-1\right)}{3}+\frac{\log\left(\cos\left(x\right)+2\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(-2+cos(x)+cos(x)**2),x)
```

```
[Out] -log(cos(x) - 1)/3 + log(cos(x) + 2)/3
```

3.10 $\int \frac{\sin(x)}{4-5\cos(x)+\cos^2(x)}\,dx$

Optimal. Leaf size=23

$$\frac{1}{3}\log(1-\cos(x))-\frac{1}{3}\log(4-\cos(x))$$

```
[Out] 1/3*ln(1-cos(x))-1/3*ln(4-cos(x))
```

Rubi [A] time = 0.03, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3259, 616, 31}

$$\frac{1}{3}\log(1-\cos(x))-\frac{1}{3}\log(4-\cos(x))$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]/(4 - 5*Cos[x] + Cos[x]^2),x]
```

```
[Out] Log[1 - Cos[x]]/3 - Log[4 - Cos[x]]/3
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 616

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = Rt[b^2
 - 4*a*c, 2]}, Dist[c/q, Int[1/Simp[b/2 - q/2 + c*x, x], x], x] - Dist[c/q,
 Int[1/Simp[b/2 + q/2 + c*x, x], x], x]] /; FreeQ[{a, b, c}, x] && NeQ[b^2
- 4*a*c, 0] && PosQ[b^2 - 4*a*c] && PerfectSquareQ[b^2 - 4*a*c]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\sin(x)}{4-5\cos(x)+\cos^2(x)}\,dx &= -\text{Subst}\left(\int \frac{1}{4-5x+x^2}\,dx, x, \cos(x)\right)\\
&= -\left(\frac{1}{3}\text{Subst}\left(\int \frac{1}{-4+x}\,dx, x, \cos(x)\right)\right) + \frac{1}{3}\text{Subst}\left(\int \frac{1}{-1+x}\,dx, x, \cos(x)\right)\\
&= \frac{1}{3}\log(1-\cos(x)) - \frac{1}{3}\log(4-\cos(x))
\end{aligned}
$$

Mathematica [**A**] time = 0.01, size = 29, normalized size = 1.26

$$\frac{2}{3}\log\left(\sin\left(\frac{x}{2}\right)\right) - \frac{1}{3}\log\left(2\sin^2\left(\frac{x}{2}\right)+3\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]/(4 - 5*Cos[x] + Cos[x]^2),x]
[Out] (2*Log[Sin[x/2]])/3 - Log[3 + 2*Sin[x/2]^2]/3
```

fricas [**A**] time = 0.48, size = 19, normalized size = 0.83

$$\frac{1}{3}\log\left(-\frac{1}{2}\cos(x)+\frac{1}{2}\right) - \frac{1}{3}\log\left(-\cos(x)+4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(4-5*cos(x)+cos(x)^2),x, algorithm="fricas")
[Out] 1/3*log(-1/2*cos(x) + 1/2) - 1/3*log(-cos(x) + 4)
```

giac [**A**] time = 0.42, size = 19, normalized size = 0.83

$$-\frac{1}{3}\log\left(-\cos(x)+4\right) + \frac{1}{3}\log\left(-\cos(x)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(4-5*cos(x)+cos(x)^2),x, algorithm="giac")
[Out] -1/3*log(-cos(x) + 4) + 1/3*log(-cos(x) + 1)
```

maple [**A**] time = 0.08, size = 16, normalized size = 0.70

$$-\frac{\ln\left(\cos(x)-4\right)}{3} + \frac{\ln\left(-1+\cos(x)\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(4-5*cos(x)+cos(x)^2),x)
```

```
[Out] -1/3*ln(cos(x)-4)+1/3*ln(-1+cos(x))
```

maxima [**A**] time = 0.32, size = 15, normalized size = 0.65

$$\frac{1}{3}\,\log\left(\cos(x)-1\right)-\frac{1}{3}\,\log\left(\cos(x)-4\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(4-5*cos(x)+cos(x)^2),x, algorithm="maxima")
```

```
[Out] 1/3*log(cos(x) - 1) - 1/3*log(cos(x) - 4)
```

mupad [**B**] time = 0.10, size = 9, normalized size = 0.39

$$\frac{2\,\mathrm{atanh}\left(\frac{2\,\cos(x)}{3}-\frac{5}{3}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(cos(x)^2 - 5*cos(x) + 4),x)
```

```
[Out] (2*atanh((2*cos(x))/3 - 5/3))/3
```

sympy [**A**] time = 0.18, size = 15, normalized size = 0.65

$$-\frac{\log\left(\cos\left(x\right)-4\right)}{3}+\frac{\log\left(\cos\left(x\right)-1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(4-5*cos(x)+cos(x)**2),x)
```

```
[Out] -log(cos(x) - 4)/3 + log(cos(x) - 1)/3
```

3.11 $\int \frac{\sin(x)}{3-2\cos(x)+\cos^2(x)}\,dx$

Optimal. Leaf size=19

$$\frac{\tan^{-1}\left(\frac{1-\cos(x)}{\sqrt{2}}\right)}{\sqrt{2}}$$

```
[Out] 1/2*arctan(1/2*(1-cos(x))*2^(1/2))*2^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3259, 618, 204}

$$\frac{\tan^{-1}\left(\frac{1-\cos(x)}{\sqrt{2}}\right)}{\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]/(3 - 2*Cos[x] + Cos[x]^2),x]
```

```
[Out] ArcTan[(1 - Cos[x])/Sqrt[2]]/Sqrt[2]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$\int \frac{\sin(x)}{3-2\cos(x)+\cos^2(x)}\,dx = -\operatorname{Subst}\left(\int \frac{1}{3-2x+x^2}\,dx, x, \cos(x)\right)$$
$$= 2\operatorname{Subst}\left(\int \frac{1}{-8-x^2}\,dx, x, -2+2\cos(x)\right)$$
$$= \frac{\tan^{-1}\left(\frac{1-\cos(x)}{\sqrt{2}}\right)}{\sqrt{2}}$$

Mathematica [A] time = 0.03, size = 18, normalized size = 0.95

$$-\frac{\tan^{-1}\left(\frac{\cos(x)-1}{\sqrt{2}}\right)}{\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]/(3 - 2*Cos[x] + Cos[x]^2),x]
[Out] -(ArcTan[(-1 + Cos[x])/Sqrt[2]]/Sqrt[2])
```

fricas [A] time = 0.76, size = 19, normalized size = 1.00

$$-\frac{1}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\cos(x)-\frac{1}{2}\sqrt{2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(3-2*cos(x)+cos(x)^2),x, algorithm="fricas")
[Out] -1/2*sqrt(2)*arctan(1/2*sqrt(2)*cos(x) - 1/2*sqrt(2))
```

giac [A] time = 0.60, size = 15, normalized size = 0.79

$$-\frac{1}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}(\cos(x)-1)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(3-2*cos(x)+cos(x)^2),x, algorithm="giac")
[Out] -1/2*sqrt(2)*arctan(1/2*sqrt(2)*(cos(x) - 1))
```

maple [A] time = 0.07, size = 18, normalized size = 0.95

$$-\frac{\sqrt{2}\ \arctan\left(\frac{(-2+2\cos(x))\sqrt{2}}{4}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(3-2*cos(x)+cos(x)^2),x)
[Out] -1/2*2^(1/2)*arctan(1/4*(-2+2*cos(x))*2^(1/2))
```

maxima [A] time = 0.85, size = 15, normalized size = 0.79

$$-\frac{1}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}(\cos(x)-1)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(3-2*cos(x)+cos(x)^2),x, algorithm="maxima")
[Out] -1/2*sqrt(2)*arctan(1/2*sqrt(2)*(cos(x) - 1))
```

mupad [B] time = 0.05, size = 15, normalized size = 0.79

$$-\frac{\sqrt{2}\ \mathrm{atan}\left(\frac{\sqrt{2}\ (\cos(x)-1)}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(cos(x)^2 - 2*cos(x) + 3),x)
[Out] -(2^(1/2)*atan((2^(1/2)*(cos(x) - 1))/2))/2
```

sympy [A] time = 0.27, size = 26, normalized size = 1.37

$$-\frac{\sqrt{2}\ \mathrm{atan}\left(\frac{\sqrt{2}\cos(x)}{2}-\frac{\sqrt{2}}{2}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(3-2*cos(x)+cos(x)**2),x)
[Out] -sqrt(2)*atan(sqrt(2)*cos(x)/2 - sqrt(2)/2)/2
```

3.12 $\int \frac{\sin(x)}{(13-4\cos(x)+\cos^2(x))^2}\,dx$

Optimal. Leaf size=36

$$\frac{2-\cos(x)}{18\left(\cos^2(x)-4\cos(x)+13\right)}-\frac{1}{54}\tan^{-1}\left(\frac{1}{3}(\cos(x)-2)\right)$$

```
[Out] -1/54*arctan(-2/3+1/3*cos(x))+1/18*(2-cos(x))/(13-4*cos(x)+cos(x)^2)
```

Rubi [A] time = 0.03, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3259, 614, 618, 204}

$$\frac{2-\cos(x)}{18\left(\cos^2(x)-4\cos(x)+13\right)}-\frac{1}{54}\tan^{-1}\left(\frac{1}{3}(\cos(x)-2)\right)$$

Antiderivative was successfully verified.

```
[In] Int[Sin[x]/(13 - 4*Cos[x] + Cos[x]^2)^2,x]
```

```
[Out] -ArcTan[(-2 + Cos[x])/3]/54 + (2 - Cos[x])/(18*(13 - 4*Cos[x] + Cos[x]^2))
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 614

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((b + 2*c*x
)*(a + b*x + c*x^2)^(p + 1))/((p + 1)*(b^2 - 4*a*c)), x] - Dist[(2*c*(2*p +
 3))/((p + 1)*(b^2 - 4*a*c)), Int[(a + b*x + c*x^2)^(p + 1), x], x] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0] && LtQ[p, -1] && NeQ[p, -3/2] && Int
egerQ[4*p]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3259

```
Int[((a_.) + (b_.)*(cos[(d_.) + (e_.)*(x_)]*(f_.))^(n_.) + (c_.)*(cos[(d_.)
 + (e_.)*(x_)]*(f_.))^(n2_.))^(p_.)*sin[(d_.) + (e_.)*(x_)]^(m_.), x_Symbol
] :> Module[{g = FreeFactors[Cos[d + e*x], x]}, -Dist[g/e, Subst[Int[(1 - g
^2*x^2)^((m - 1)/2)*(a + b*(f*g*x)^n + c*(f*g*x)^(2*n))^p, x], x, Cos[d + e
*x]/g], x]] /; FreeQ[{a, b, c, d, e, f, n, p}, x] && EqQ[n2, 2*n] && Intege
rQ[(m - 1)/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sin(x)}{\left(13-4\cos(x)+\cos^2(x)\right)^2}\,dx &= -\text{Subst}\left(\int \frac{1}{\left(13-4x+x^2\right)^2}\,dx,x,\cos(x)\right)\\ &= \frac{2-\cos(x)}{18\left(13-4\cos(x)+\cos^2(x)\right)}-\frac{1}{18}\text{Subst}\left(\int \frac{1}{13-4x+x^2}\,dx,x,\cos(x)\right)\\ &= \frac{2-\cos(x)}{18\left(13-4\cos(x)+\cos^2(x)\right)}+\frac{1}{9}\text{Subst}\left(\int \frac{1}{-36-x^2}\,dx,x,-4+2\cos(x)\right)\\ &= -\frac{1}{54}\tan^{-1}\left(\frac{1}{3}(-2+\cos(x))\right)+\frac{2-\cos(x)}{18\left(13-4\cos(x)+\cos^2(x)\right)}\end{aligned}$$

Mathematica [A] time = 0.08, size = 34, normalized size = 0.94

$$-\frac{\cos(x)-2}{18\left(\cos^2(x)-4\cos(x)+13\right)}-\frac{1}{54}\tan^{-1}\left(\frac{1}{3}(\cos(x)-2)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Sin[x]/(13 - 4*Cos[x] + Cos[x]^2)^2,x]
```

```
[Out] -1/54*ArcTan[(-2 + Cos[x])/3] - (-2 + Cos[x])/(18*(13 - 4*Cos[x] + Cos[x]^2
))
```

fricas [A] time = 1.12, size = 38, normalized size = 1.06

$$-\frac{\left(\cos(x)^2-4\cos(x)+13\right)\arctan\left(\frac{1}{3}\cos(x)-\frac{2}{3}\right)+3\cos(x)-6}{54\left(\cos(x)^2-4\cos(x)+13\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(13-4*cos(x)+cos(x)^2)^2,x, algorithm="fricas")
```

```
[Out] -1/54*((cos(x)^2 - 4*cos(x) + 13)*arctan(1/3*cos(x) - 2/3) + 3*cos(x) - 6)/
(cos(x)^2 - 4*cos(x) + 13)
```

giac [A] time = 0.48, size = 28, normalized size = 0.78

$$-\frac{\cos(x) - 2}{18\left(\cos(x)^2 - 4\cos(x) + 13\right)} - \frac{1}{54}\arctan\left(\frac{1}{3}\cos(x) - \frac{2}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(13-4*cos(x)+cos(x)^2)^2,x, algorithm="giac")
```

```
[Out] -1/18*(cos(x) - 2)/(cos(x)^2 - 4*cos(x) + 13) - 1/54*arctan(1/3*cos(x) - 2/
3)
```

maple [A] time = 0.08, size = 31, normalized size = 0.86

$$-\frac{2\cos(x) - 4}{36\left(13 - 4\cos(x) + \cos^2(x)\right)} - \frac{\arctan\left(-\frac{2}{3} + \frac{\cos(x)}{3}\right)}{54}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(13-4*cos(x)+cos(x)^2)^2,x)
```

```
[Out] -1/36*(2*cos(x)-4)/(13-4*cos(x)+cos(x)^2)-1/54*arctan(-2/3+1/3*cos(x))
```

maxima [A] time = 0.90, size = 28, normalized size = 0.78

$$-\frac{\cos(x) - 2}{18\left(\cos(x)^2 - 4\cos(x) + 13\right)} - \frac{1}{54}\arctan\left(\frac{1}{3}\cos(x) - \frac{2}{3}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(13-4*cos(x)+cos(x)^2)^2,x, algorithm="maxima")
```

```
[Out] -1/18*(cos(x) - 2)/(cos(x)^2 - 4*cos(x) + 13) - 1/54*arctan(1/3*cos(x) - 2/
3)
```

mupad [B] time = 0.06, size = 30, normalized size = 0.83

$$-\frac{\operatorname{atan}\left(\frac{\cos(x)}{3} - \frac{2}{3}\right)}{54} - \frac{\frac{\cos(x)}{18} - \frac{1}{9}}{\cos(x)^2 - 4\cos(x) + 13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sin(x)/(cos(x)^2 - 4*cos(x) + 13)^2,x)
```

```
[Out] - atan(cos(x)/3 - 2/3)/54 - (cos(x)/18 - 1/9)/(cos(x)^2 - 4*cos(x) + 13)
```

sympy [B] time = 1.02, size = 116, normalized size = 3.22

$$-\frac{\cos^2(x)\,\mathrm{atan}\left(\frac{\cos(x)}{3}-\frac{2}{3}\right)}{54\cos^2(x)-216\cos(x)+702}+\frac{4\cos(x)\,\mathrm{atan}\left(\frac{\cos(x)}{3}-\frac{2}{3}\right)}{54\cos^2(x)-216\cos(x)+702}-\frac{3\cos(x)}{54\cos^2(x)-216\cos(x)+702}-\frac{13\,\mathrm{atan}}{54\cos^2(x)-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sin(x)/(13-4*cos(x)+cos(x)**2)**2,x)
```

```
[Out] -cos(x)**2*atan(cos(x)/3 - 2/3)/(54*cos(x)**2 - 216*cos(x) + 702) + 4*cos(x
)*atan(cos(x)/3 - 2/3)/(54*cos(x)**2 - 216*cos(x) + 702) - 3*cos(x)/(54*cos
(x)**2 - 216*cos(x) + 702) - 13*atan(cos(x)/3 - 2/3)/(54*cos(x)**2 - 216*co
s(x) + 702) + 6/(54*cos(x)**2 - 216*cos(x) + 702)
```

3.13 $\int \frac{\cos^4(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=326

$$-\frac{2\left(-\frac{2a^2c^2-4ab^2c+b^4}{\sqrt{b^2-4ac}}-2abc+b^3\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{c^3\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{2\left(\frac{2a^2c^2-4ab^2c+b^4}{\sqrt{b^2-4ac}}-2abc+b^3\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-\cdots}}}{\sqrt{\sqrt{b^2-4ac\cdots}}}\right)}{c^3\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+\cdots}}$$

```
[Out] 1/2*x/c+(-a*c+b^2)*x/c^3-b*sin(x)/c^2+1/2*cos(x)*sin(x)/c-2*arctan((b-2*c-(
-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2))*(b^3-
2*a*b*c+(-2*a^2*c^2+4*a*b^2*c-b^4)/(-4*a*c+b^2)^(1/2))/c^3/(b-2*c-(-4*a*c+b
^2)^(1/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)-2*arctan((b-2*c+(-4*a*c+b
^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2))*(b^3-2*a*b*c+
(2*a^2*c^2-4*a*b^2*c+b^4)/(-4*a*c+b^2)^(1/2))/c^3/(b-2*c+(-4*a*c+b^2)^(1/2)
)^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2)
```

Rubi [A] time = 4.06, antiderivative size = 326, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.368$, Rules used = {3257, 2637, 2635, 8, 3293, 2659, 205}

$$-\frac{2\left(-\frac{2a^2c^2-4ab^2c+b^4}{\sqrt{b^2-4ac}}-2abc+b^3\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{c^3\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{2\left(\frac{2a^2c^2-4ab^2c+b^4}{\sqrt{b^2-4ac}}-2abc+b^3\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-\cdots}}}{\sqrt{\sqrt{b^2-4ac\cdots}}}\right)}{c^3\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+\cdots}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[x]^4/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] x/(2*c) + ((b^2 - a*c)*x)/c^3 - (2*(b^3 - 2*a*b*c - (b^4 - 4*a*b^2*c + 2*a^
2*c^2)/Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Tan[x/2
]])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/(c^3*Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c
]]*Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]) - (2*(b^3 - 2*a*b*c + (b^4 - 4*a*b^2*
c + 2*a^2*c^2)/Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]
*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]])/(c^3*Sqrt[b - 2*c + Sqrt[b^2
 - 4*a*c]]*Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]) - (b*Sin[x])/c^2 + (Cos[x]*Si
n[x])/(2*c)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2635

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Sin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Sin[c
+ d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n
]
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3257

```
Int[cos[(d_.) + (e_.)*(x_)]^(m_.)*((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b
_.) + cos[(d_.) + (e_.)*(x_)]^(n2_.)*(c_.))^(p_), x_Symbol] :> Int[ExpandTr
ig[cos[d + e*x]^m*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n))^p, x], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && NeQ[b^2 - 4*a*c, 0] && Integ
ersQ[m, n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rubi steps

$$\int \frac{\cos^4(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(\frac{b^2-ac}{c^3} - \frac{b\cos(x)}{c^2} + \frac{\cos^2(x)}{c} + \frac{-ab^2\left(1-\frac{ac}{b^2}\right)-b^3\left(1-\frac{2ac}{b^2}\right)\cos(x)}{c^3\left(a+b\cos(x)+c\cos^2(x)\right)}\right)dx$$

$$= \frac{\left(b^2-ac\right)x}{c^3} + \frac{\int \frac{-ab^2\left(1-\frac{ac}{b^2}\right)-b^3\left(1-\frac{2ac}{b^2}\right)\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{c^3} - \frac{b\int\cos(x)\,dx}{c^2} + \frac{\int\cos^2(x)\,dx}{c}$$

$$= \frac{\left(b^2-ac\right)x}{c^3} - \frac{b\sin(x)}{c^2} + \frac{\cos(x)\sin(x)}{2c} + \frac{\int 1\,dx}{2c} - \frac{\left(b^3-2abc-\frac{b^4-4ab^2c+2a^2c^2}{\sqrt{b^2-4ac}}\right)\ldots}{c^3}$$

$$= \frac{x}{2c} + \frac{\left(b^2-ac\right)x}{c^3} - \frac{b\sin(x)}{c^2} + \frac{\cos(x)\sin(x)}{2c} - \frac{\left(2\left(b^3-2abc-\frac{b^4-4ab^2c+2a^2c^2}{\sqrt{b^2-4ac}}\right)\right)\ldots}{\ldots}$$

$$= \frac{x}{2c} + \frac{\left(b^2-ac\right)x}{c^3} - \frac{2\left(b^3-2abc-\frac{b^4-4ab^2c+2a^2c^2}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{c^3\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}} - \ldots$$

Mathematica [A] time = 1.13, size = 356, normalized size = 1.09

$$\frac{\frac{4\sqrt{2}\left(2a^2c^2-4ab^2c-2abc\sqrt{b^2-4ac}+b^3\sqrt{b^2-4ac}+b^4\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}} - \frac{4\sqrt{2}\left(-2a^2c^2+4ab^2c-2abc\sqrt{b^2-4ac}+b^3\sqrt{b^2-4ac}-b^4\right)\tan\ldots}{\sqrt{b^2-4ac}\sqrt{b\sqrt{b^2-4ac}+2c(a+\ldots}}\ldots}{4c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[x]^4/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (4*b^2*x + 2*c*(-2*a + c)*x + (4*Sqrt[2]*(b^4 - 4*a*b^2*c + 2*a^2*c^2 + b^3
*Sqrt[b^2 - 4*a*c] - 2*a*b*c*Sqrt[b^2 - 4*a*c])*ArcTanh[((b - 2*c + Sqrt[b^
2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) - 2*b*Sqrt[b^2 - 4*a*c]]])/
(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a + c) - b*Sqrt[b^2 - 4*a*c]]) - (4*Sqr
t[2]*(-b^4 + 4*a*b^2*c - 2*a^2*c^2 + b^3*Sqrt[b^2 - 4*a*c] - 2*a*b*c*Sqrt[b
^2 - 4*a*c])*ArcTanh[((-b + 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2
+ 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c
*(a + c) + b*Sqrt[b^2 - 4*a*c]]) - 4*b*c*Sin[x] + c^2*Sin[2*x])/(4*c^3)
```

fricas [B] time = 10.03, size = 8167, normalized size = 25.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)^4/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(2)*c^3*sqrt((a^2*b^6 - b^8 - 2*a^4*c^4 - 2*(a^5 - 8*a^3*b^2)*c^3
+ (9*a^4*b^2 - 20*a^2*b^4)*c^2 - 2*(3*a^3*b^4 - 4*a*b^6)*c - (4*a*c^9 + (8*
a^2 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt(-(a^4*
b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a^5*b^4)*c^5
+ (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 31*a^5*b^6 +
32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2 - 4*(2*a^5*
b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16 + 12*(2*a^3
 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3*a^3*b^2 + 2
*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12)))/(4*a*c^9 + (8*a^2 - b^2)
*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6))*log(8*a^7*b*c^4 + 2*
(3*a^8*b - 10*a^6*b^3)*c^3 - 4*(2*a^7*b^3 - 3*a^5*b^5)*c^2 - (4*a^5*c^9 + (
8*a^6 - a^4*b^2)*c^8 + 2*(2*a^7 - 3*a^5*b^2)*c^7 - (a^6*b^2 - a^4*b^4)*c^6)
*sqrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a
^5*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 3
1*a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2
 - 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16
 + 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3
*a^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12))*cos(x) + 2*(a
^6*b^5 - a^4*b^7)*c + 1/2*sqrt(2)*((8*a^3*c^12 + 6*(4*a^4 - 3*a^2*b^2)*c^11
 + 2*(12*a^5 - 25*a^3*b^2 + 4*a*b^4)*c^10 + (8*a^6 - 38*a^4*b^2 + 35*a^2*b^
4 - b^6)*c^9 - 2*(3*a^5*b^2 - 8*a^3*b^4 + 5*a*b^6)*c^8 + (a^4*b^4 - 2*a^2*b
^6 + b^8)*c^7)*sqrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*
a^7*b^2 - 10*a^5*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*
(6*a^7*b^4 - 31*a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28
*a^2*b^10)*c^2 - 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a
^2 - b^2)*c^16 + 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^1
4 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12))
*sin(x) + (32*a^5*b^2*c^6 + 8*(5*a^6*b^2 - 13*a^4*b^4)*c^5 + 2*(6*a^7*b^2 -
 47*a^5*b^4 + 56*a^3*b^6)*c^4 - (19*a^6*b^4 - 69*a^4*b^6 + 54*a^2*b^8)*c^3
+ 4*(2*a^5*b^6 - 5*a^3*b^8 + 3*a*b^10)*c^2 - (a^4*b^8 - 2*a^2*b^10 + b^12)*
c)*sin(x))*sqrt((a^2*b^6 - b^8 - 2*a^4*c^4 - 2*(a^5 - 8*a^3*b^2)*c^3 + (9*a
^4*b^2 - 20*a^2*b^4)*c^2 - 2*(3*a^3*b^4 - 4*a*b^6)*c - (4*a*c^9 + (8*a^2 -
b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt(-(a^4*b^10 -
 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a^5*b^4)*c^5 + (9*a
^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 31*a^5*b^6 + 32*a^3
*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2 - 4*(2*a^5*b^8 -
5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16 + 12*(2*a^3 - a*b
^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4
)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12)))/(4*a*c^9 + (8*a^2 - b^2)*c^8 +
 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)) + (a^6*b^6 - a^4*b^8 + 4*a
^7*b^2*c^3 + (3*a^8*b^2 - 10*a^6*b^4)*c^2 - 2*(2*a^7*b^4 - 3*a^5*b^6)*c)*co
```

```
s(x)) - sqrt(2)*c^3*sqrt((a^2*b^6 - b^8 - 2*a^4*c^4 - 2*(a^5 - 8*a^3*b^2)*c
^3 + (9*a^4*b^2 - 20*a^2*b^4)*c^2 - 2*(3*a^3*b^4 - 4*a*b^6)*c - (4*a*c^9 +
(8*a^2 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt(-(a
^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a^5*b^4)*c
^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 31*a^5*b^6
 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2 - 4*(2*a
^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16 + 12*(2*
a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3*a^3*b^2
+ 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12)))/(4*a*c^9 + (8*a^2 - b
^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6))*log(8*a^7*b*c^4 +
 2*(3*a^8*b - 10*a^6*b^3)*c^3 - 4*(2*a^7*b^3 - 3*a^5*b^5)*c^2 - (4*a^5*c^9
+ (8*a^6 - a^4*b^2)*c^8 + 2*(2*a^7 - 3*a^5*b^2)*c^7 - (a^6*b^2 - a^4*b^4)*c
^6)*sqrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 1
0*a^5*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4
- 31*a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*
c^2 - 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c
^16 + 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5
- 3*a^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12))*cos(x) + 2
*(a^6*b^5 - a^4*b^7)*c - 1/2*sqrt(2)*((8*a^3*c^12 + 6*(4*a^4 - 3*a^2*b^2)*c
^11 + 2*(12*a^5 - 25*a^3*b^2 + 4*a*b^4)*c^10 + (8*a^6 - 38*a^4*b^2 + 35*a^2
*b^4 - b^6)*c^9 - 2*(3*a^5*b^2 - 8*a^3*b^4 + 5*a*b^6)*c^8 + (a^4*b^4 - 2*a^
2*b^6 + b^8)*c^7)*sqrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*
(3*a^7*b^2 - 10*a^5*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 -
 4*(6*a^7*b^4 - 31*a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 +
 28*a^2*b^10)*c^2 - 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (1
6*a^2 - b^2)*c^16 + 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*
c^14 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^1
2))*sin(x) + (32*a^5*b^2*c^6 + 8*(5*a^6*b^2 - 13*a^4*b^4)*c^5 + 2*(6*a^7*b^
2 - 47*a^5*b^4 + 56*a^3*b^6)*c^4 - (19*a^6*b^4 - 69*a^4*b^6 + 54*a^2*b^8)*c
^3 + 4*(2*a^5*b^6 - 5*a^3*b^8 + 3*a*b^10)*c^2 - (a^4*b^8 - 2*a^2*b^10 + b^1
2)*c)*sin(x))*sqrt((a^2*b^6 - b^8 - 2*a^4*c^4 - 2*(a^5 - 8*a^3*b^2)*c^3 + (
9*a^4*b^2 - 20*a^2*b^4)*c^2 - 2*(3*a^3*b^4 - 4*a*b^6)*c - (4*a*c^9 + (8*a^2
 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt(-(a^4*b^1
0 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a^5*b^4)*c^5 + (
9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 31*a^5*b^6 + 32*
a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2 - 4*(2*a^5*b^8
 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16 + 12*(2*a^3 -
a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3*a^3*b^2 + 2*a*
b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12)))/(4*a*c^9 + (8*a^2 - b^2)*c^
8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)) + (a^6*b^6 - a^4*b^8 +
4*a^7*b^2*c^3 + (3*a^8*b^2 - 10*a^6*b^4)*c^2 - 2*(2*a^7*b^4 - 3*a^5*b^6)*c)
*cos(x)) + sqrt(2)*c^3*sqrt((a^2*b^6 - b^8 - 2*a^4*c^4 - 2*(a^5 - 8*a^3*b^2
)*c^3 + (9*a^4*b^2 - 20*a^2*b^4)*c^2 - 2*(3*a^3*b^4 - 4*a*b^6)*c + (4*a*c^9
 + (8*a^2 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt(
-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a^5*b^4
```

```
)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 31*a^5*
b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2 - 4*(
2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16 + 12*
(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3*a^3*b
^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12)))/(4*a*c^9 + (8*a^2
- b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6))*log(-8*a^7*b*c
^4 - 2*(3*a^8*b - 10*a^6*b^3)*c^3 + 4*(2*a^7*b^3 - 3*a^5*b^5)*c^2 - (4*a^5*
c^9 + (8*a^6 - a^4*b^2)*c^8 + 2*(2*a^7 - 3*a^5*b^2)*c^7 - (a^6*b^2 - a^4*b^
4)*c^6)*sqrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2
 - 10*a^5*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*
b^4 - 31*a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^
10)*c^2 - 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^
2)*c^16 + 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(
a^5 - 3*a^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12))*cos(x)
 - 2*(a^6*b^5 - a^4*b^7)*c + 1/2*sqrt(2)*((8*a^3*c^12 + 6*(4*a^4 - 3*a^2*b^
2)*c^11 + 2*(12*a^5 - 25*a^3*b^2 + 4*a*b^4)*c^10 + (8*a^6 - 38*a^4*b^2 + 35
*a^2*b^4 - b^6)*c^9 - 2*(3*a^5*b^2 - 8*a^3*b^4 + 5*a*b^6)*c^8 + (a^4*b^4 -
2*a^2*b^6 + b^8)*c^7)*sqrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6
+ 8*(3*a^7*b^2 - 10*a^5*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c
^4 - 4*(6*a^7*b^4 - 31*a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b
^8 + 28*a^2*b^10)*c^2 - 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17
+ (16*a^2 - b^2)*c^16 + 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b
^4)*c^14 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)
*c^12))*sin(x) - (32*a^5*b^2*c^6 + 8*(5*a^6*b^2 - 13*a^4*b^4)*c^5 + 2*(6*a^
7*b^2 - 47*a^5*b^4 + 56*a^3*b^6)*c^4 - (19*a^6*b^4 - 69*a^4*b^6 + 54*a^2*b^
8)*c^3 + 4*(2*a^5*b^6 - 5*a^3*b^8 + 3*a*b^10)*c^2 - (a^4*b^8 - 2*a^2*b^10 +
 b^12)*c)*sin(x))*sqrt((a^2*b^6 - b^8 - 2*a^4*c^4 - 2*(a^5 - 8*a^3*b^2)*c^3
 + (9*a^4*b^2 - 20*a^2*b^4)*c^2 - 2*(3*a^3*b^4 - 4*a*b^6)*c + (4*a*c^9 + (8
*a^2 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt(-(a^4
*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a^5*b^4)*c^5
 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 31*a^5*b^6 +
 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2 - 4*(2*a^5
*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16 + 12*(2*a^
3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3*a^3*b^2 +
2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12)))/(4*a*c^9 + (8*a^2 - b^2
)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)) - (a^6*b^6 - a^4*b^
8 + 4*a^7*b^2*c^3 + (3*a^8*b^2 - 10*a^6*b^4)*c^2 - 2*(2*a^7*b^4 - 3*a^5*b^6
)*c)*cos(x)) - sqrt(2)*c^3*sqrt((a^2*b^6 - b^8 - 2*a^4*c^4 - 2*(a^5 - 8*a^3
*b^2)*c^3 + (9*a^4*b^2 - 20*a^2*b^4)*c^2 - 2*(3*a^3*b^4 - 4*a*b^6)*c + (4*a
*c^9 + (8*a^2 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*s
qrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a^5
*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 31*
a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2 -
 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16 +
 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3*a
```

```
^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12)))/(4*a*c^9 + (8*
a^2 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6))*log(-8*a^7
*b*c^4 - 2*(3*a^8*b - 10*a^6*b^3)*c^3 + 4*(2*a^7*b^3 - 3*a^5*b^5)*c^2 - (4*
a^5*c^9 + (8*a^6 - a^4*b^2)*c^8 + 2*(2*a^7 - 3*a^5*b^2)*c^7 - (a^6*b^2 - a^
4*b^4)*c^6)*sqrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7
*b^2 - 10*a^5*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*
a^7*b^4 - 31*a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^
2*b^10)*c^2 - 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2
- b^2)*c^16 + 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 +
 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12))*co
s(x) - 2*(a^6*b^5 - a^4*b^7)*c - 1/2*sqrt(2)*((8*a^3*c^12 + 6*(4*a^4 - 3*a^
2*b^2)*c^11 + 2*(12*a^5 - 25*a^3*b^2 + 4*a*b^4)*c^10 + (8*a^6 - 38*a^4*b^2
+ 35*a^2*b^4 - b^6)*c^9 - 2*(3*a^5*b^2 - 8*a^3*b^4 + 5*a*b^6)*c^8 + (a^4*b^
4 - 2*a^2*b^6 + b^8)*c^7)*sqrt(-(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*
c^6 + 8*(3*a^7*b^2 - 10*a^5*b^4)*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^
6)*c^4 - 4*(6*a^7*b^4 - 31*a^5*b^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a
^4*b^8 + 28*a^2*b^10)*c^2 - 4*(2*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c
^17 + (16*a^2 - b^2)*c^16 + 12*(2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2
 + b^4)*c^14 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 +
b^6)*c^12))*sin(x) - (32*a^5*b^2*c^6 + 8*(5*a^6*b^2 - 13*a^4*b^4)*c^5 + 2*(
6*a^7*b^2 - 47*a^5*b^4 + 56*a^3*b^6)*c^4 - (19*a^6*b^4 - 69*a^4*b^6 + 54*a^
2*b^8)*c^3 + 4*(2*a^5*b^6 - 5*a^3*b^8 + 3*a*b^10)*c^2 - (a^4*b^8 - 2*a^2*b^
10 + b^12)*c)*sin(x))*sqrt((a^2*b^6 - b^8 - 2*a^4*c^4 - 2*(a^5 - 8*a^3*b^2)
*c^3 + (9*a^4*b^2 - 20*a^2*b^4)*c^2 - 2*(3*a^3*b^4 - 4*a*b^6)*c + (4*a*c^9
+ (8*a^2 - b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)*sqrt(-
(a^4*b^10 - 2*a^2*b^12 + b^14 + 16*a^6*b^2*c^6 + 8*(3*a^7*b^2 - 10*a^5*b^4)
*c^5 + (9*a^8*b^2 - 92*a^6*b^4 + 148*a^4*b^6)*c^4 - 4*(6*a^7*b^4 - 31*a^5*b
^6 + 32*a^3*b^8)*c^3 + 2*(11*a^6*b^6 - 37*a^4*b^8 + 28*a^2*b^10)*c^2 - 4*(2
*a^5*b^8 - 5*a^3*b^10 + 3*a*b^12)*c)/(4*a*c^17 + (16*a^2 - b^2)*c^16 + 12*(
2*a^3 - a*b^2)*c^15 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^14 + 4*(a^5 - 3*a^3*b^
2 + 2*a*b^4)*c^13 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^12)))/(4*a*c^9 + (8*a^2 -
 b^2)*c^8 + 2*(2*a^3 - 3*a*b^2)*c^7 - (a^2*b^2 - b^4)*c^6)) - (a^6*b^6 - a^
4*b^8 + 4*a^7*b^2*c^3 + (3*a^8*b^2 - 10*a^6*b^4)*c^2 - 2*(2*a^7*b^4 - 3*a^5
*b^6)*c)*cos(x)) + 2*(2*b^2 - 2*a*c + c^2)*x + 2*(c^2*cos(x) - 2*b*c)*sin(x
))/c^3
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)^4/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.12, size = 3427, normalized size = 10.51

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(x)^4/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] -2/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(
1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b+1/c^2/(-4*a*c+b^2)^(1/
2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/
2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^4-1/c^3/(a-b+c)/(((-4*a*c+
b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/
2)+a-c)*(a-b+c))^(1/2))*b^2*a^2-2/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+
c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2
))*a*b+1/c^3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^
(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b
^5-1/c^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2
)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^4-1
/c^3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*ar
ctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^5+1/2
*x/c+1/c*b/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1
/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a
^2+3/c^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2
)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b
^3-1/c*b/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2
)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2-3
/c^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*ar
ctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a*b^3-3/c
^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/
2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2*b-2/c^3*a/(-4*a*c+b^2)^(
1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/
2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^4-2/c^2/(tan(1/2*x)^2+1)^2
*tan(1/2*x)^3*b-2/c^2/(tan(1/2*x)^2+1)^2*tan(1/2*x)*b+3/c^2/(-4*a*c+b^2)^(1
/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^3*b-7/c^2/(-4*a*c+b^2)^(1
/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2*b^2+2/c^3*a/(-4*a*c+b^2
)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*t
an(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^4+2/c/(-4*a*c+b^2)^(1
/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^3-3/c^2/(a-b+c)/(((-4*a*c
+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1
/2)+a-c)*(a-b+c))^(1/2))*a^2*b-2/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2
)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+
```

```
a-c)*(a-b+c))^(1/2))*a^3+1/c^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(
1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*
a*b^2+1/c^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a*b^2+2/c^3*a/(a-b+c)
/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4
*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^3-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4
*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2
)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2+1/c^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a
-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))
^(1/2))*b^3+1/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-
a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2+1/c^2/(a-b+
c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4
*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^3-1/c^3/(a-b+c)/(((-4*a*c+b^2)^(1/2)
+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a
-b+c))^(1/2))*b^4+1/c^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*ar
ctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3+1/c^2
/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*
x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^3+2/(-4*a*c+b^2)^(1/2)/(a-b+
c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((
-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2-1/c^3/(a-b+c)/(((-4*a*c+b^2)^(1/
2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c
)*(a-b+c))^(1/2))*b^4+4/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a
-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b
+c))^(1/2))*a*b^2+1/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arct
an((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2+1/c^3/(
-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((
a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2*b^3-4/c/(-4
*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-
a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b^2+7/c^2/(-4
*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-
b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2*b^2-3/c^2/(-4
*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-
b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^3*b-1/c^3/(-4*a
*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+
b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2*b^3+2/c^3*a/(
a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(
((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3-1/c^3/(a-b+c)/(((-4*a*c+b^2)^(
1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a
+c)*(a-b+c))^(1/2))*b^2*a^2-1/c/(tan(1/2*x)^2+1)^2*tan(1/2*x)^3+1/c/(tan(1/
2*x)^2+1)^2*tan(1/2*x)-2/c^2*arctan(tan(1/2*x))*a+2/c^3*arctan(tan(1/2*x))*
b^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)^4/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] 1/4*(4*c^3*integrate(-2*(2*(b^4 - 2*a*b^2*c)*cos(3*x)^2 + 4*(2*a^2*b^2 - a^
2*c^2 - (2*a^3 - a*b^2)*c)*cos(2*x)^2 + 2*(b^4 - 2*a*b^2*c)*cos(x)^2 + 2*(b
^4 - 2*a*b^2*c)*sin(3*x)^2 + 4*(2*a^2*b^2 - a^2*c^2 - (2*a^3 - a*b^2)*c)*si
n(2*x)^2 + 2*(4*a*b^3 - 2*a*b*c^2 - (6*a^2*b - b^3)*c)*sin(2*x)*sin(x) + 2*
(b^4 - 2*a*b^2*c)*sin(x)^2 + ((b^3*c - 2*a*b*c^2)*cos(3*x) + 2*(a*b^2*c - a
^2*c^2)*cos(2*x) + (b^3*c - 2*a*b*c^2)*cos(x))*cos(4*x) + (b^3*c - 2*a*b*c^
2 + 2*(4*a*b^3 - 2*a*b*c^2 - (6*a^2*b - b^3)*c)*cos(2*x) + 4*(b^4 - 2*a*b^2
*c)*cos(x))*cos(3*x) + 2*(a*b^2*c - a^2*c^2 + (4*a*b^3 - 2*a*b*c^2 - (6*a^2
*b - b^3)*c)*cos(x))*cos(2*x) + (b^3*c - 2*a*b*c^2)*cos(x) + ((b^3*c - 2*a*
b*c^2)*sin(3*x) + 2*(a*b^2*c - a^2*c^2)*sin(2*x) + (b^3*c - 2*a*b*c^2)*sin(
x))*sin(4*x) + 2*((4*a*b^3 - 2*a*b*c^2 - (6*a^2*b - b^3)*c)*sin(2*x) + 2*(b
^4 - 2*a*b^2*c)*sin(x))*sin(3*x))/(c^5*cos(4*x)^2 + 4*b^2*c^3*cos(3*x)^2 +
4*b^2*c^3*cos(x)^2 + c^5*sin(4*x)^2 + 4*b^2*c^3*sin(3*x)^2 + 4*b^2*c^3*sin(
x)^2 + 4*b*c^4*cos(x) + c^5 + 4*(4*a^2*c^3 + 4*a*c^4 + c^5)*cos(2*x)^2 + 4*
(4*a^2*c^3 + 4*a*c^4 + c^5)*sin(2*x)^2 + 8*(2*a*b*c^3 + b*c^4)*sin(2*x)*sin
(x) + 2*(2*b*c^4*cos(3*x) + 2*b*c^4*cos(x) + c^5 + 2*(2*a*c^4 + c^5)*cos(2*
x))*cos(4*x) + 4*(2*b^2*c^3*cos(x) + b*c^4 + 2*(2*a*b*c^3 + b*c^4)*cos(2*x)
)*cos(3*x) + 4*(2*a*c^4 + c^5 + 2*(2*a*b*c^3 + b*c^4)*cos(x))*cos(2*x) + 4*
(b*c^4*sin(3*x) + b*c^4*sin(x) + (2*a*c^4 + c^5)*sin(2*x))*sin(4*x) + 8*(b^
2*c^3*sin(x) + (2*a*b*c^3 + b*c^4)*sin(2*x))*sin(3*x)), x) + c^2*sin(2*x) -
 4*b*c*sin(x) + 2*(2*b^2 - 2*a*c + c^2)*x)/c^3
```

mupad [B] time = 14.69, size = 45364, normalized size = 139.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(x)^4/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] atan(((((2048*(12*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7
*c^7 + 12*a^8*c^6 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*
c^5 - 30*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9
 - 72*a*b^5*c^8 + 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9
*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a
^4*b*c^9 + 100*a^5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 +
 145*a^2*b^3*c^9 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 63
5*a^2*b^7*c^5 - 202*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^
3*b^2*c^9 - 524*a^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b
^6*c^5 + 856*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8
+ 9*a^4*b^3*c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 15
6*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5
```

*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3
*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 + (((2048*(16*a^3*c^13 - 32*
a^2*c^14 + 176*a^4*c^12 + 176*a^5*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c
^11 - 18*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12
 + 122*a*b^4*c^11 - 192*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b
*c^13 - 144*a^3*b*c^12 - 352*a^4*b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12
 + 388*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 2
60*a^3*b^2*c^11 + 496*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*
a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 - (20
48*tan(x/2)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)
^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^
2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*
a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2
)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c
 - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32
*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32
*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^1
5 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 3
2*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*
a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14
 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*
a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*
b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c
^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4
*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 3
3*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3
)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2
)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c -
 b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c
^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*
c^7)))^(1/2) - (2048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a
^4*c^11 - 192*a^5*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12
 - 17*b^4*c^11 + 33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^
9*c^6 - 24*b^10*c^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b
^4*c^10 - 416*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 7
2*a*b^9*c^5 - 8*a*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^1
0 + 496*a^5*b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 72
3*a^2*b^4*c^9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^
2*b^8*c^5 - 8*a^2*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^
4*c^8 + 572*a^3*b^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4
+ 234*a^4*b^2*c^9 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 -
72*a^4*b^6*c^5 + 64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a
^6*b^2*c^7 - 24*a*b*c^13))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 -
 b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(
1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 -

38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*
b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*
a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/
(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9
 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2))*(-
(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10
*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4
*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^
3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3
*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/
2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*
a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 +
 a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(20*a*b^12 + 4*b^12*
c - 4*b^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9
 - 18*a^5*c^8 + 38*a^6*c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5
 - b^9*c^4 + 4*b^10*c^3 - 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*
c^4 + 20*a*b^9*c^3 - 20*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^
4*b*c^8 - 300*a^4*b^8*c - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a
^6*b^6*c + 168*a^7*b*c^5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 +
82*a^2*b^6*c^5 + 6*a^2*b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^
2*c^8 - 40*a^3*b^3*c^7 - 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4
 + 72*a^3*b^7*c^3 + 460*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41
*a^4*b^4*c^5 - 149*a^4*b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5
*b^2*c^6 + 96*a^5*b^3*c^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^
6*c^2 - 204*a^6*b^2*c^5 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c
^2 + 384*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 +
24*a*b^11*c))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c
 - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2
*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^
3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*
c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(
-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^
10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c
^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*1i - (((2048*(12
*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7*c^7 + 12*a^8*c^6
 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*c^5 - 30*b^10*c^4
 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9 - 72*a*b^5*c^8 +
 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9*c^4 + 98*a*b^10*
c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a^4*b*c^9 + 100*a^
5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 + 145*a^2*b^3*c^9
 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 635*a^2*b^7*c^5 - 2
02*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^3*b^2*c^9 - 524*a
^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b^6*c^5 + 856*a^3*
b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8 + 9*a^4*b^3*c^7 +
 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8

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*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 388*a^
5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^
4*c^4 - 100*a^7*b^2*c^5))/c^8 + (((2048*(16*a^3*c^13 - 32*a^2*c^14 + 176*a^
4*c^12 + 176*a^5*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18*b^6*c^10
 + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a*b^4*c^11
 - 192*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 - 144*a^3*b
*c^12 - 352*a^4*b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a^2*b^3*c^
11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b^2*c^11 +
 496*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*c^10 + 11
6*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 + (2048*tan(x/2)*(-(a^
2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^
3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^
3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b
*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^
4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2)
+ 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4
*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^
2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14
+ 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b
^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*
a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13
 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*
a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4
*b^2*c^11 - 96*a*b*c^15))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 -
b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1
/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 3
8*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b
^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a
^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(
2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9
+ 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) + (2
048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 192*a^5
*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^11 +
33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^10*c
^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 416*a*b
^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a
*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*b*c^9
 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^9 + 7
79*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2
*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*a^3*b
^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^2*c^9
 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c^5 +
64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 - 24*a
*b*c^13))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b
^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6
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*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2))*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) + (2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^8 + 38*a^6*c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 + 4*b^10*c^3 - 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b^9*c^3 - 20*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 300*a^4*b^8*c - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 168*a^7*b*c^5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c^5 + 6*a^2*b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a^3*b^3*c^7 - 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 460*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5 - 149*a^4*b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^2 - 204*a^6*b^2*c^5 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 384*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a*b^11*c))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*1i)/((4096*(16*a^5*b^7 - 4*a^4*b^8 - 24*a^6*b^6 + 16*a^7*b^5 - 4*a^8*b^4 + 3*a^6*c^6 - 10*a^7*c^5 + a^8*c^4 + 14*a^9*c^3 + 4*a^4*b^7*c - 2*a^5*b*c^6 + 4*a^5*b^6*c + 6*a^6*b*c^5 - 40*a^6*b^5*c + 4*a^7*b*c^4 + 56*a^7*b^4*c - 22*a^8*b*c^3 - 28*a^8*b^3*c + 12*a^9*b*c^2 + 4*a^9*b^2*c + a^4*b^3*c^5 - a^4*b^4*c^4 + 4*a^4*b^5*c^3 - 4*a^4*b^6*c^2 - a^5*b^2*c^5 - 8*a^5*b^3*c^4 + 10*a^6*b^2*c^4 - 4*a^6*b^3*c^3 - 8*a^6*b^4*c^2 + 4*a^7*b^2*c^3 + 48*a^7*b^3*c^2 - 48*a^8*b^2*c^2))/c^8 + (((2048*(12*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7*c^7 + 12*a^8*c^6 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*c^5 - 30*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9 - 72*a*b^5*c^8 + 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9*c^4 + 98*a*

b^10*c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a^4*b*c^9 + 1
00*a^5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 + 145*a^2*b^3
*c^9 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 635*a^2*b^7*c^
5 - 202*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^3*b^2*c^9 -
524*a^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b^6*c^5 + 856
*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8 + 9*a^4*b^3*
c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 156*a^4*b^7*c^
3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 3
88*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a
^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 + (((2048*(16*a^3*c^13 - 32*a^2*c^14 + 1
76*a^4*c^12 + 176*a^5*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18*b^6
*c^10 + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a*b^4
*c^11 - 192*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 - 144*
a^3*b*c^12 - 352*a^4*b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a^2*b
^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b^2*c
^11 + 496*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*c^10
 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 - (2048*tan(x/2)*
(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) -
10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b
^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*
a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) +
 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(
1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 1
6*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8
 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*
c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 +
 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 +
 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b
*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11
 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 5
6*a^4*b^2*c^11 - 96*a*b*c^15))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c
^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^
3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^
2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*
a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) -
 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/
2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2
*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)
 - (2048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 19
2*a^5*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^
11 + 33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b
^10*c^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 41
6*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5
 - 8*a*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*
b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^

9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 -
8*a^2*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*
a^3*b^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^
2*c^9 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c
^5 + 64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 -
24*a*b*c^13))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*
c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^
2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c
^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a
*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*
(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c
^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*
c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2))*(-(a^2*b^8 - b
^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c +
a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^
4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4
*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(
-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5
c(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^
4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6
- 8*a^3*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 -
40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^
8 + 38*a^6*c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 +
4*b^10*c^3 - 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b
^9*c^3 - 20*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 30
0*a^4*b^8*c - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 1
68*a^7*b*c^5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c
^5 + 6*a^2*b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a
^3*b^3*c^7 - 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^
7*c^3 + 460*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5
- 149*a^4*b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 9
6*a^5*b^3*c^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^2 - 204*
a^6*b^2*c^5 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 384*a^7
*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a*b^11*c)
)/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(
1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 9
6*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8
*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^
(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^
2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*
c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*
b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) + (((2048*(12*a^3*c^11 - 28*
a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7*c^7 + 12*a^8*c^6 + b^5*c^9 - 4*
b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*c^5 - 30*b^10*c^4 + 26*b^11*c^3
- 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9 - 72*a*b^5*c^8 + 154*a*b^6*c^7

- 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11
*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a^4*b*c^9 + 100*a^5*b*c^8 - 200*a
^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 + 145*a^2*b^3*c^9 - 354*a^2*b^4*c
^8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 635*a^2*b^7*c^5 - 202*a^2*b^8*c^4
- 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^3*b^2*c^9 - 524*a^3*b^3*c^8 + 53
6*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b^6*c^5 + 856*a^3*b^7*c^4 + 2*a^3
*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8 + 9*a^4*b^3*c^7 + 583*a^4*b^4*c^
6 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 -
399*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*
a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7
*b^2*c^5))/c^8 + (((2048*(16*a^3*c^13 - 32*a^2*c^14 + 176*a^4*c^12 + 176*a^
5*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18*b^6*c^10 + 26*b^7*c^9 -
12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a*b^4*c^11 - 192*a*b^5*c^
10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 - 144*a^3*b*c^12 - 352*a^4
*b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a^2*b^3*c^11 - 50*a^2*b^4
*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b^2*c^11 + 496*a^3*b^3*c^
10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*c^10 + 116*a^4*b^3*c^9 +
8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 + (2048*tan(x/2)*(-(a^2*b^8 - b^10 +
8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b
^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*
c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c -
b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*
c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(
4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8
- b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a
^3*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 +
96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^
6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56
*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^1
2 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 -
272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*
a*b*c^15))/c^8)*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c -
b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^
6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 +
12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c -
b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4
*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10
+ 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7
- 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) + (2048*tan(x/2)*(8
*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 192*a^5*c^10 - 136*a^6
*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^11 + 33*b^5*c^10 - 4
9*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^10*c^5 + 8*b^11*c^4
+ 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 416*a*b^5*c^9 + 375*a*
b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a*b^10*c^4 + 184
*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*b*c^9 - 88*a^6*b*c^8

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 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^9 + 779*a^2*b^5*c^8
- 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2*b^9*c^4 + 180*
a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*a^3*b^5*c^7 - 424*a^
3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^2*c^9 - 1152*a^4*b^3
*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c^5 + 64*a^5*b^2*c^8
+ 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 - 24*a*b*c^13))/c^8)*
(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) -
10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b
^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*
a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) +
 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(
1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 1
6*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8
 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2))*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*
a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c -
b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b
^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2)
 - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1
/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3
)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*
a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^
(1/2) + (2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 - 40*a^2*b^11 + 40*a^
3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^8 + 38*a^6*c^7 + 2*a
^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 + 4*b^10*c^3 - 4*b^11*
c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b^9*c^3 - 20*a*b^10*c
^2 - 160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 300*a^4*b^8*c - 84*a^5
*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 168*a^7*b*c^5 - 92*a^
8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c^5 + 6*a^2*b^7*c^4 +
 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a^3*b^3*c^7 - 104*a^3
*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 460*a^3*b^8*
c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5 - 149*a^4*b^5*c^4 -
 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 541*
a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^2 - 204*a^6*b^2*c^5 - 704*a^
6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 384*a^7*b^2*c^4 + 272*a^7*b
^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a*b^11*c))/c^8)*(-(a^2*b^8 -
b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c
+ a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a
^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(
4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*
(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^
5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b
^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^
6 - 8*a^3*b^2*c^7)))^(1/2)))*(-(a^2*b^8 - b^10 + 8*a^5*c^5 + 8*a^6*c^4 - b^
7*(-(4*a*c - b^2)^3)^(1/2) - 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2
) - 52*a^2*b^6*c^2 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + 33*a^4*b^4*c^2 - 38*
```

a^5*b^2*c^3 + 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3
c(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2
*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*
(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 +
10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*2i - (
(tan(x/2)*(2*b - c))/c^2 + (tan(x/2)^3*(2*b + c))/c^2)/(2*tan(x/2)^2 + tan(
x/2)^4 + 1) + atan(((((2048*(12*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^
6*c^8 + 88*a^7*c^7 + 12*a^8*c^6 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8
*c^6 + 29*b^9*c^5 - 30*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10
+ 27*a*b^4*c^9 - 72*a*b^5*c^8 + 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c
^5 - 228*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*
b*c^10 + 112*a^4*b*c^9 + 100*a^5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*
a^2*b^2*c^10 + 145*a^2*b^3*c^9 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^
2*b^6*c^6 + 635*a^2*b^7*c^5 - 202*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^1
0*c^2 + 239*a^3*b^2*c^9 - 524*a^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c
^6 - 115*a^3*b^6*c^5 + 856*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3
7*a^4*b^2*c^8 + 9*a^4*b^3*c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^
4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3
*c^6 + 394*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6
+ 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 + (((2048*(16*
a^3*c^13 - 32*a^2*c^14 + 176*a^4*c^12 + 176*a^5*c^11 + 48*a^6*c^10 - 2*b^4*
c^12 + 6*b^5*c^11 - 18*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^13 -
40*a*b^3*c^12 + 122*a*b^4*c^11 - 192*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*
c^8 + 64*a^2*b*c^13 - 144*a^3*b*c^12 - 352*a^4*b*c^11 - 144*a^5*b*c^10 - 20
4*a^2*b^2*c^12 + 388*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a
^2*b^6*c^8 - 260*a^3*b^2*c^11 + 496*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*
b^5*c^8 - 148*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c
^9))/c^8 - (2048*tan(x/2)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-
(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) +
52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*
b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(
-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3
c^2(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*
a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a
*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*(32*a*c^16
- 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24
*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^
2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 2
88*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b
^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*
c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^8)*((b^10 - a^2*b
^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c +
a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4
*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*
a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-

(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*
c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4
*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6
- 8*a^3*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*
c^12 + 168*a^4*c^11 - 192*a^5*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13
+ 6*b^3*c^12 - 17*b^4*c^11 + 33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8
*c^7 + 36*b^9*c^6 - 24*b^10*c^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^
11 + 295*a*b^4*c^10 - 416*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a
*b^8*c^6 - 72*a*b^9*c^5 - 8*a*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 -
16*a^4*b*c^10 + 496*a^5*b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b
^3*c^10 - 723*a^2*b^4*c^9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*
c^6 + 112*a^2*b^8*c^5 - 8*a^2*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9
+ 521*a^3*b^4*c^8 + 572*a^3*b^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*
a^3*b^8*c^4 + 234*a^4*b^2*c^9 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^
4*b^5*c^6 - 72*a^4*b^6*c^5 + 64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4
*c^6 - 256*a^6*b^2*c^7 - 24*a*b*c^13))/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 -
8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c
- b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4
*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/
2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^
(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)
^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 -
8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7))
)^(1/2))*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^
(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 -
96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^
8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)
^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b
^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3
*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2
*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(20*a*b^12
+ 4*b^12*c - 4*b^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 +
2*a^4*c^9 - 18*a^5*c^8 + 38*a^6*c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4
+ b^8*c^5 - b^9*c^4 + 4*b^10*c^3 - 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 -
31*a*b^8*c^4 + 20*a*b^9*c^3 - 20*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9
*c + 26*a^4*b*c^8 - 300*a^4*b^8*c - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*
c^6 - 24*a^6*b^6*c + 168*a^7*b*c^5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*
b^5*c^6 + 82*a^2*b^6*c^5 + 6*a^2*b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 -
16*a^3*b^2*c^8 - 40*a^3*b^3*c^7 - 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a
^3*b^6*c^4 + 72*a^3*b^7*c^3 + 460*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^
3*c^6 + 41*a^4*b^4*c^5 - 149*a^4*b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^
2 - 90*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 +
764*a^5*b^6*c^2 - 204*a^6*b^2*c^5 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300
*a^6*b^5*c^2 + 384*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*
b^2*c^3 + 24*a*b^11*c))/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7

```
*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2)
 + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a
^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*
c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*
b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(
16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 1
0*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*1i - ((
(2048*(12*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7*c^7 + 1
2*a^8*c^6 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*c^5 - 30
*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9 - 72*a*
b^5*c^8 + 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9*c^4 + 9
8*a*b^10*c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a^4*b*c^9
 + 100*a^5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 + 145*a^2
*b^3*c^9 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 635*a^2*b^
7*c^5 - 202*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^3*b^2*c^
9 - 524*a^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b^6*c^5 +
 856*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8 + 9*a^4*
b^3*c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 156*a^4*b^
7*c^3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5*b^4*c^5
 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 1
36*a^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 + (((2048*(16*a^3*c^13 - 32*a^2*c^14
 + 176*a^4*c^12 + 176*a^5*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18
*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a
*b^4*c^11 - 192*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 -
144*a^3*b*c^12 - 352*a^4*b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a
^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b
^2*c^11 + 496*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*
c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 + (2048*tan(x
/2)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2)
 + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^
3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c +
 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2
) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3
)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9
+ 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*
c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a
^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^1
3 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^1
3 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^
3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c
^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10
- 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6
*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2
)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*
c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) -
```

4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2)
 - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b
^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/
2) + (2048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 -
192*a^5*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*
c^11 + 33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24
*b^10*c^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 -
416*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^
5 - 8*a*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^
5*b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*
c^9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5
 - 8*a^2*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 57
2*a^3*b^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*
b^2*c^9 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6
*c^5 + 64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7
 - 24*a*b*c^13))/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a
*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a
^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*
c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*
a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2
*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*
c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4
*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2))*((b^10 - a^2*
b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c +
 a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^
4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4
*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(
-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5
c(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^
4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6
 - 8*a^3*b^2*c^7)))^(1/2) + (2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 -
 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^
8 + 38*a^6*c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 +
4*b^10*c^3 - 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b
^9*c^3 - 20*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 30
0*a^4*b^8*c - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 1
68*a^7*b*c^5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c
^5 + 6*a^2*b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a
^3*b^3*c^7 - 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^
7*c^3 + 460*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5
 - 149*a^4*b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 9
6*a^5*b^3*c^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^2 - 204*
a^6*b^2*c^5 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 384*a^7
*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a*b^11*c)

```
)/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1
/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96
*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*
c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(
1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2
)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c
^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b
^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*1i)/((4096*(16*a^5*b^7 - 4*a^
4*b^8 - 24*a^6*b^6 + 16*a^7*b^5 - 4*a^8*b^4 + 3*a^6*c^6 - 10*a^7*c^5 + a^8*
c^4 + 14*a^9*c^3 + 4*a^4*b^7*c - 2*a^5*b*c^6 + 4*a^5*b^6*c + 6*a^6*b*c^5 -
40*a^6*b^5*c + 4*a^7*b*c^4 + 56*a^7*b^4*c - 22*a^8*b*c^3 - 28*a^8*b^3*c + 1
2*a^9*b*c^2 + 4*a^9*b^2*c + a^4*b^3*c^5 - a^4*b^4*c^4 + 4*a^4*b^5*c^3 - 4*a
^4*b^6*c^2 - a^5*b^2*c^5 - 8*a^5*b^3*c^4 + 10*a^6*b^2*c^4 - 4*a^6*b^3*c^3 -
 8*a^6*b^4*c^2 + 4*a^7*b^2*c^3 + 48*a^7*b^3*c^2 - 48*a^8*b^2*c^2))/c^8 + ((
(2048*(12*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7*c^7 + 1
2*a^8*c^6 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*c^5 - 30
*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9 - 72*a*
b^5*c^8 + 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9*c^4 + 9
8*a*b^10*c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a^4*b*c^9
 + 100*a^5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 + 145*a^2
*b^3*c^9 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 635*a^2*b^
7*c^5 - 202*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^3*b^2*c^
9 - 524*a^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b^6*c^5 +
 856*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8 + 9*a^4*
b^3*c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 156*a^4*b^
7*c^3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5*b^4*c^5
 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 1
36*a^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 + (((2048*(16*a^3*c^13 - 32*a^2*c^14
 + 176*a^4*c^12 + 176*a^5*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18
*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a
*b^4*c^11 - 192*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 -
144*a^3*b*c^12 - 352*a^4*b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a
^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b
^2*c^11 + 496*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*
c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 - (2048*tan(x
/2)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2)
 + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^
3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c +
 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2
) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3
)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9
+ 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*
c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a
^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^1
3 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^1
```

3 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^
3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c
^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10
- 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6
c^4 - b^7(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2
)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*
c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) -
4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2)
- 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b
^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/
2) - (2048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 -
192*a^5*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*
c^11 + 33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24
*b^10*c^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 -
416*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^
5 - 8*a*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^
5*b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*
c^9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5
- 8*a^2*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 57
2*a^3*b^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*
b^2*c^9 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6
*c^5 + 64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7
- 24*a*b*c^13))/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a
*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a
^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*
c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*
a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2
*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*
c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4
*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2))*((b^10 - a^2*
b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c +
a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^
4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4
*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(
-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5
c(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^
4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6
- 8*a^3*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 -
40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^
8 + 38*a^6*c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 +
4*b^10*c^3 - 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b
^9*c^3 - 20*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 30
0*a^4*b^8*c - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 1
68*a^7*b*c^5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c

^5 + 6*a^2*b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a
^3*b^3*c^7 - 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^
7*c^3 + 460*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5
 - 149*a^4*b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 9
6*a^5*b^3*c^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^2 - 204*
a^6*b^2*c^5 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 384*a^7
*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a*b^11*c)
)/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1
/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96
*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*
c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(
1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2
)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c
^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b
^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) + (((2048*(12*a^3*c^11 - 28*a
^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7*c^7 + 12*a^8*c^6 + b^5*c^9 - 4*b
^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*c^5 - 30*b^10*c^4 + 26*b^11*c^3 -
 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9 - 72*a*b^5*c^8 + 154*a*b^6*c^7 -
 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*
c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a^4*b*c^9 + 100*a^5*b*c^8 - 200*a^
6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 + 145*a^2*b^3*c^9 - 354*a^2*b^4*c^
8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 635*a^2*b^7*c^5 - 202*a^2*b^8*c^4 -
 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^3*b^2*c^9 - 524*a^3*b^3*c^8 + 536
*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b^6*c^5 + 856*a^3*b^7*c^4 + 2*a^3*
b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8 + 9*a^4*b^3*c^7 + 583*a^4*b^4*c^6
 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 3
99*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a
^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*
b^2*c^5))/c^8 + (((2048*(16*a^3*c^13 - 32*a^2*c^14 + 176*a^4*c^12 + 176*a^5
*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18*b^6*c^10 + 26*b^7*c^9 -
12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a*b^4*c^11 - 192*a*b^5*c^1
0 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 - 144*a^3*b*c^12 - 352*a^4*
b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a^2*b^3*c^11 - 50*a^2*b^4*
c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b^2*c^11 + 496*a^3*b^3*c^1
0 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*c^10 + 116*a^4*b^3*c^9 +
8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 + (2048*tan(x/2)*((b^10 - a^2*b^8 - 8*
a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5
*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^
4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b
^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*
a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 -
b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3
*b^2*c^7)))^(1/2)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 9
6*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*

c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a
*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12
- 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 27
2*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*
b*c^15))/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2
)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c
^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12
*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^
2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*
c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 3
2*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 3
2*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) + (2048*tan(x/2)*(8*a*
c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 192*a^5*c^10 - 136*a^6*c^
9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^11 + 33*b^5*c^10 - 49*b
^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^10*c^5 + 8*b^11*c^4 +
84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 416*a*b^5*c^9 + 375*a*b^6
*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a*b^10*c^4 + 184*a^
2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*b*c^9 - 88*a^6*b*c^8 -
416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^9 + 779*a^2*b^5*c^8 - 7
32*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2*b^9*c^4 + 180*a^3
*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*a^3*b^5*c^7 - 424*a^3*b
^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^2*c^9 - 1152*a^4*b^3*c^
8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c^5 + 64*a^5*b^2*c^8 + 1
92*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 - 24*a*b*c^13))/c^8)*((b
^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a
^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c
^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*
b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a
^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2)
 + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^
4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a
^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2))*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c
^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^
3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^
2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*
a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) -
 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/
2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2
*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)
 + (2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 - 40*a^2*b^11 + 40*a^3*b^1
0 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^8 + 38*a^6*c^7 + 2*a^7*c^
6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 + 4*b^10*c^3 - 4*b^11*c^2 -
 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b^9*c^3 - 20*a*b^10*c^2 -
160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 300*a^4*b^8*c - 84*a^5*b*c^
7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 168*a^7*b*c^5 - 92*a^8*b*c

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^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c^5 + 6*a^2*b^7*c^4 + 8*a^
2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a^3*b^3*c^7 - 104*a^3*b^4*
c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 460*a^3*b^8*c^2 +
 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5 - 149*a^4*b^5*c^4 - 660*
a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 541*a^5*b
^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^2 - 204*a^6*b^2*c^5 - 704*a^6*b^3
*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 384*a^7*b^2*c^4 + 272*a^7*b^3*c^
3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a*b^11*c))/c^8)*((b^10 - a^2*b^8 -
 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*
b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2
*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c
- b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a
*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-
(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8
 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*
a^3*b^2*c^7)))^(1/2)))*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*
a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*
a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2
*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4
*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^
2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2
*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^
4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2)*2i + (atan(-(
(((2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 - 40*a^2*b^11 + 40*a^3*b^10
 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^8 + 38*a^6*c^7 + 2*a^7*c^6
 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 + 4*b^10*c^3 - 4*b^11*c^2 -
8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b^9*c^3 - 20*a*b^10*c^2 - 1
60*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 300*a^4*b^8*c - 84*a^5*b*c^7
 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 168*a^7*b*c^5 - 92*a^8*b*c^
4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c^5 + 6*a^2*b^7*c^4 + 8*a^2
*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a^3*b^3*c^7 - 104*a^3*b^4*c
^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 460*a^3*b^8*c^2 +
82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5 - 149*a^4*b^5*c^4 - 660*a
^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 541*a^5*b^
4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^2 - 204*a^6*b^2*c^5 - 704*a^6*b^3*
c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 384*a^7*b^2*c^4 + 272*a^7*b^3*c^3
 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a*b^11*c))/c^8 - (((2048*(12*a^3*c^
11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7*c^7 + 12*a^8*c^6 + b^5*
c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*c^5 - 30*b^10*c^4 + 26*b
^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9 - 72*a*b^5*c^8 + 154*a*
b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9*c^4 + 98*a*b^10*c^3 + 2
0*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a^4*b*c^9 + 100*a^5*b*c^8
 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 + 145*a^2*b^3*c^9 - 354*a
^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 635*a^2*b^7*c^5 - 202*a^2*
b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^3*b^2*c^9 - 524*a^3*b^3*
```

c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b^6*c^5 + 856*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8 + 9*a^4*b^3*c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 - (((2048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 192*a^5*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^11 + 33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^10*c^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 416*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*a^3*b^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^2*c^9 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c^5 + 64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 - 24*a*b*c^13))/c^8 - (((2048*(16*a^3*c^13 - 32*a^2*c^14 + 176*a^4*c^12 + 176*a^5*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a*b^4*c^11 - 192*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 - 144*a^3*b*c^12 - 352*a^4*b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b^2*c^11 + 496*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 - (1024*tan(x/2)*(b^2*2i - a*c*2i + c^2*1i)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^11)*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i)*1i)/(2*c^3) + (((2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^8 + 38*a^6*c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 + 4*b^10*c^3 - 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b^9*c^3 - 20*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 300*a^4*b^8*c - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 168*a^7*b*c^5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c^5 + 6*a^2*b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a^3*b^3*c^7 - 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 460*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5 - 149*a^4*b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^

```
2 - 204*a^6*b^2*c^5 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 +
 384*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a
*b^11*c))/c^8 + (((2048*(12*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^
8 + 88*a^7*c^7 + 12*a^8*c^6 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6
 + 29*b^9*c^5 - 30*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10 + 27
*a*b^4*c^9 - 72*a*b^5*c^8 + 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c^5 -
 228*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^
10 + 112*a^4*b*c^9 + 100*a^5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*
b^2*c^10 + 145*a^2*b^3*c^9 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^2*b^
6*c^6 + 635*a^2*b^7*c^5 - 202*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^
2 + 239*a^3*b^2*c^9 - 524*a^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c^6 -
 115*a^3*b^6*c^5 + 856*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^
4*b^2*c^8 + 9*a^4*b^3*c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^4*b^
6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3*c^6
 + 394*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 3
64*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 + (((2048*tan(x/2)
*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 192*a^5*c^10 - 136*
a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^11 + 33*b^5*c^10
- 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^10*c^5 + 8*b^11*
c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 416*a*b^5*c^9 + 375
*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a*b^10*c^4 +
184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*b*c^9 - 88*a^6*b*
c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^9 + 779*a^2*b^5*c
^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2*b^9*c^4 + 1
80*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*a^3*b^5*c^7 - 424
*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^2*c^9 - 1152*a^4*
b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c^5 + 64*a^5*b^2*c
^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 - 24*a*b*c^13))/c^
8 + (((2048*(16*a^3*c^13 - 32*a^2*c^14 + 176*a^4*c^12 + 176*a^5*c^11 + 48*a
^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 +
 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a*b^4*c^11 - 192*a*b^5*c^10 + 74*a*b^6
*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 - 144*a^3*b*c^12 - 352*a^4*b*c^11 - 144
*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a
^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b^2*c^11 + 496*a^3*b^3*c^10 + 10*a^3*b
^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^
8 - 44*a^5*b^2*c^9))/c^8 + (1024*tan(x/2)*(b^2*2i - a*c*2i + c^2*1i)*(32*a*
c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15
+ 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*
a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10
 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a
^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*
b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^11)*(b^2*2i -
 a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i -
a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i)*1i)/(2*c^3))/((4096*(
16*a^5*b^7 - 4*a^4*b^8 - 24*a^6*b^6 + 16*a^7*b^5 - 4*a^8*b^4 + 3*a^6*c^6 -
```

10*a^7*c^5 + a^8*c^4 + 14*a^9*c^3 + 4*a^4*b^7*c - 2*a^5*b*c^6 + 4*a^5*b^6*c
 + 6*a^6*b*c^5 - 40*a^6*b^5*c + 4*a^7*b*c^4 + 56*a^7*b^4*c - 22*a^8*b*c^3 -
 28*a^8*b^3*c + 12*a^9*b*c^2 + 4*a^9*b^2*c + a^4*b^3*c^5 - a^4*b^4*c^4 + 4*
a^4*b^5*c^3 - 4*a^4*b^6*c^2 - a^5*b^2*c^5 - 8*a^5*b^3*c^4 + 10*a^6*b^2*c^4
- 4*a^6*b^3*c^3 - 8*a^6*b^4*c^2 + 4*a^7*b^2*c^3 + 48*a^7*b^3*c^2 - 48*a^8*b
^2*c^2))/c^8 - (((2048*tan(x/2)*(20*a*b^12 + 4*b^12*c - 4*b^13 - 40*a^2*b^1
1 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2*a^4*c^9 - 18*a^5*c^8 + 38*a^6*
c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 + b^8*c^5 - b^9*c^4 + 4*b^10*c^3
- 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 31*a*b^8*c^4 + 20*a*b^9*c^3 - 20
*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9*c + 26*a^4*b*c^8 - 300*a^4*b^8*c
 - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^6 - 24*a^6*b^6*c + 168*a^7*b*c^
5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^5*c^6 + 82*a^2*b^6*c^5 + 6*a^2*
b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 16*a^3*b^2*c^8 - 40*a^3*b^3*c^7
- 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 460
*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*c^6 + 41*a^4*b^4*c^5 - 149*a^4*
b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2 - 90*a^5*b^2*c^6 + 96*a^5*b^3*c
^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 764*a^5*b^6*c^2 - 204*a^6*b^2*c^5
 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a^6*b^5*c^2 + 384*a^7*b^2*c^4 +
272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^2*c^3 + 24*a*b^11*c))/c^8 - (((
2048*(12*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9 + 72*a^6*c^8 + 88*a^7*c^7 + 12
*a^8*c^6 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7 - 20*b^8*c^6 + 29*b^9*c^5 - 30*
b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b^3*c^10 + 27*a*b^4*c^9 - 72*a*b
^5*c^8 + 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251*a*b^8*c^5 - 228*a*b^9*c^4 + 98
*a*b^10*c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 - 68*a^3*b*c^10 + 112*a^4*b*c^9
+ 100*a^5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c^6 - 47*a^2*b^2*c^10 + 145*a^2*
b^3*c^9 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7 - 655*a^2*b^6*c^6 + 635*a^2*b^7
*c^5 - 202*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^10*c^2 + 239*a^3*b^2*c^9
 - 524*a^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a^3*b^5*c^6 - 115*a^3*b^6*c^5 +
856*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 37*a^4*b^2*c^8 + 9*a^4*b
^3*c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 156*a^4*b^7
*c^3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904*a^5*b^3*c^6 + 394*a^5*b^4*c^5
- 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 13
6*a^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 - (((2048*tan(x/2)*(8*a*c^14 - 64*a^2
*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 192*a^5*c^10 - 136*a^6*c^9 + 72*a^7*c^
8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^11 + 33*b^5*c^10 - 49*b^6*c^9 + 61*b
^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^10*c^5 + 8*b^11*c^4 + 84*a*b^2*c^12
 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 416*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*
b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a*b^10*c^4 + 184*a^2*b*c^12 - 32
8*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c
^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^
7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2*b^9*c^4 + 180*a^3*b^2*c^10 - 4
94*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*a^3*b^5*c^7 - 424*a^3*b^6*c^6 + 56*a
^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^2*c^9 - 1152*a^4*b^3*c^8 + 416*a^4*b
^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c^5 + 64*a^5*b^2*c^8 + 192*a^5*b^3*c^
7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 - 24*a*b*c^13))/c^8 - (((2048*(16*a^3

*c^13 - 32*a^2*c^14 + 176*a^4*c^12 + 176*a^5*c^11 + 48*a^6*c^10 - 2*b^4*c^1
2 + 6*b^5*c^11 - 18*b^6*c^10 + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^13 - 40
*a*b^3*c^12 + 122*a*b^4*c^11 - 192*a*b^5*c^10 + 74*a*b^6*c^9 + 20*a*b^7*c^8
 + 64*a^2*b*c^13 - 144*a^3*b*c^12 - 352*a^4*b*c^11 - 144*a^5*b*c^10 - 204*a
^2*b^2*c^12 + 388*a^2*b^3*c^11 - 50*a^2*b^4*c^10 - 182*a^2*b^5*c^9 + 4*a^2*
b^6*c^8 - 260*a^3*b^2*c^11 + 496*a^3*b^3*c^10 + 10*a^3*b^4*c^9 - 20*a^3*b^5
*c^8 - 148*a^4*b^2*c^10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9)
)/c^8 - (1024*tan(x/2)*(b^2*2i - a*c*2i + c^2*1i)*(32*a*c^16 - 64*a^2*c^15
- 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 - 8*b^2*c^15 + 24*b^3*c^14 - 32*
b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7*c^10 + 144*a*b^2*c^14 - 200*a*
b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 +
 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^
2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^
4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^11)*(b^2*2i - a*c*2i + c^2*1i))/
(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(
2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3) + (((2048*tan(x/2)*(20*a*b^12 +
 4*b^12*c - 4*b^13 - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 + 2
*a^4*c^9 - 18*a^5*c^8 + 38*a^6*c^7 + 2*a^7*c^6 - 44*a^8*c^5 + 12*a^9*c^4 +
b^8*c^5 - b^9*c^4 + 4*b^10*c^3 - 4*b^11*c^2 - 8*a*b^6*c^6 + 4*a*b^7*c^5 - 3
1*a*b^8*c^4 + 20*a*b^9*c^3 - 20*a*b^10*c^2 - 160*a^2*b^10*c + 320*a^3*b^9*c
 + 26*a^4*b*c^8 - 300*a^4*b^8*c - 84*a^5*b*c^7 + 136*a^5*b^7*c + 2*a^6*b*c^
6 - 24*a^6*b^6*c + 168*a^7*b*c^5 - 92*a^8*b*c^4 + 20*a^2*b^4*c^7 + 8*a^2*b^
5*c^6 + 82*a^2*b^6*c^5 + 6*a^2*b^7*c^4 + 8*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 1
6*a^3*b^2*c^8 - 40*a^3*b^3*c^7 - 104*a^3*b^4*c^6 - 132*a^3*b^5*c^5 + 34*a^3
*b^6*c^4 + 72*a^3*b^7*c^3 + 460*a^3*b^8*c^2 + 82*a^4*b^2*c^7 + 174*a^4*b^3*
c^6 + 41*a^4*b^4*c^5 - 149*a^4*b^5*c^4 - 660*a^4*b^6*c^3 - 900*a^4*b^7*c^2
- 90*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 541*a^5*b^4*c^4 + 1156*a^5*b^5*c^3 + 76
4*a^5*b^6*c^2 - 204*a^6*b^2*c^5 - 704*a^6*b^3*c^4 - 840*a^6*b^4*c^3 - 300*a
^6*b^5*c^2 + 384*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b^4*c^2 - 32*a^8*b^
2*c^3 + 24*a*b^11*c))/c^8 + (((2048*(12*a^3*c^11 - 28*a^4*c^10 - 44*a^5*c^9
 + 72*a^6*c^8 + 88*a^7*c^7 + 12*a^8*c^6 + b^5*c^9 - 4*b^6*c^8 + 10*b^7*c^7
- 20*b^8*c^6 + 29*b^9*c^5 - 30*b^10*c^4 + 26*b^11*c^3 - 12*b^12*c^2 - 6*a*b
^3*c^10 + 27*a*b^4*c^9 - 72*a*b^5*c^8 + 154*a*b^6*c^7 - 238*a*b^7*c^6 + 251
*a*b^8*c^5 - 228*a*b^9*c^4 + 98*a*b^10*c^3 + 20*a*b^11*c^2 + 8*a^2*b*c^11 -
 68*a^3*b*c^10 + 112*a^4*b*c^9 + 100*a^5*b*c^8 - 200*a^6*b*c^7 - 96*a^7*b*c
^6 - 47*a^2*b^2*c^10 + 145*a^2*b^3*c^9 - 354*a^2*b^4*c^8 + 612*a^2*b^5*c^7
- 655*a^2*b^6*c^6 + 635*a^2*b^7*c^5 - 202*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4
*a^2*b^10*c^2 + 239*a^3*b^2*c^9 - 524*a^3*b^3*c^8 + 536*a^3*b^4*c^7 - 564*a
^3*b^5*c^6 - 115*a^3*b^6*c^5 + 856*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9
*c^2 - 37*a^4*b^2*c^8 + 9*a^4*b^3*c^7 + 583*a^4*b^4*c^6 - 1362*a^4*b^5*c^5
- 152*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 399*a^5*b^2*c^7 + 904
*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 340*a^6
*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5))/c^8 + (((2
048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 192*a^5
*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^11 +

```
33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^10*c
^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 416*a*b
^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a
*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*b*c^9
 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^9 + 7
79*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2
*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*a^3*b
^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^2*c^9
 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c^5 +
64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 - 24*a
*b*c^13))/c^8 + (((2048*(16*a^3*c^13 - 32*a^2*c^14 + 176*a^4*c^12 + 176*a^5
*c^11 + 48*a^6*c^10 - 2*b^4*c^12 + 6*b^5*c^11 - 18*b^6*c^10 + 26*b^7*c^9 -
12*b^8*c^8 + 16*a*b^2*c^13 - 40*a*b^3*c^12 + 122*a*b^4*c^11 - 192*a*b^5*c^1
0 + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^13 - 144*a^3*b*c^12 - 352*a^4*
b*c^11 - 144*a^5*b*c^10 - 204*a^2*b^2*c^12 + 388*a^2*b^3*c^11 - 50*a^2*b^4*
c^10 - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b^2*c^11 + 496*a^3*b^3*c^1
0 + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*c^10 + 116*a^4*b^3*c^9 +
8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 + (1024*tan(x/2)*(b^2*2i - a*c*2i + c^
2*1i)*(32*a*c^16 - 64*a^2*c^15 - 128*a^3*c^14 + 64*a^4*c^13 + 96*a^5*c^12 -
 8*b^2*c^15 + 24*b^3*c^14 - 32*b^4*c^13 + 32*b^5*c^12 - 24*b^6*c^11 + 8*b^7
*c^10 + 144*a*b^2*c^14 - 200*a*b^3*c^13 + 184*a*b^4*c^12 - 56*a*b^5*c^11 -
8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^
2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^
12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15))/c^1
1)*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3)
)*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))
)*(b^2*2i - a*c*2i + c^2*1i)*1i)/c^3
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)**4/(a+b*cos(x)+c*cos(x)**2),x)
[Out] Timed out
```

3.14 $\int \frac{\cos^3(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=299

$$\frac{2\left(\frac{3abc}{\sqrt{b^2-4ac}}-\frac{b^3}{\sqrt{b^2-4ac}}-ac+b^2\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{c^2\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2\left(-\frac{3abc}{\sqrt{b^2-4ac}}+\frac{b^3}{\sqrt{b^2-4ac}}-ac+b^2\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\cdots}}{\sqrt{\sqrt{b^2\cdots}}}\right.}{c^2\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b\cdots}}$$

```
[Out] -b*x/c^2+sin(x)/c+2*arctan((b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2
*c-(-4*a*c+b^2)^(1/2))^(1/2))*(b^2-a*c-b^3/(-4*a*c+b^2)^(1/2)+3*a*b*c/(-4*a
*c+b^2)^(1/2))/c^2/(b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/
2))^(1/2)+2*arctan((b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a
*c+b^2)^(1/2))^(1/2))*(b^2-a*c+b^3/(-4*a*c+b^2)^(1/2)-3*a*b*c/(-4*a*c+b^2)^
(1/2))/c^2/(b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2
)
```

Rubi [A] time = 6.76, antiderivative size = 299, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {3257, 2637, 3293, 2659, 205}

$$\frac{2\left(-\frac{b^3}{\sqrt{b^2-4ac}}+\frac{3abc}{\sqrt{b^2-4ac}}-ac+b^2\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{c^2\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2\left(\frac{b^3}{\sqrt{b^2-4ac}}-\frac{3abc}{\sqrt{b^2-4ac}}-ac+b^2\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\cdots}}{\sqrt{\sqrt{b^2\cdots}}}\right.}{c^2\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+\cdots}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[x]^3/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] -((b*x)/c^2) + (2*(b^2 - a*c - b^3/Sqrt[b^2 - 4*a*c] + (3*a*b*c)/Sqrt[b^2 -
 4*a*c])*ArcTan[(Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c -
 Sqrt[b^2 - 4*a*c]]])/(c^2*Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c -
 Sqrt[b^2 - 4*a*c]]) + (2*(b^2 - a*c + b^3/Sqrt[b^2 - 4*a*c] - (3*a*b*c)/Sq
rt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b
 + 2*c + Sqrt[b^2 - 4*a*c]]])/(c^2*Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Sqrt[b
 + 2*c + Sqrt[b^2 - 4*a*c]]) + Sin[x]/c
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3257

```
Int[cos[(d_.) + (e_.)*(x_)]^(m_.)*((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b
_.) + cos[(d_.) + (e_.)*(x_)]^(n2_.)*(c_.))^(p_), x_Symbol] :> Int[ExpandTr
ig[cos[d + e*x]^m*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n))^p, x], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && NeQ[b^2 - 4*a*c, 0] && Integ
ersQ[m, n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rubi steps

$$\int \frac{\cos^3(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(-\frac{b}{c^2}+\frac{\cos(x)}{c}+\frac{ab+b^2\left(1-\frac{ac}{b^2}\right)\cos(x)}{c^2\left(a+b\cos(x)+c\cos^2(x)\right)}\right)dx$$

$$= -\frac{bx}{c^2}+\frac{\int \frac{ab+b^2\left(1-\frac{ac}{b^2}\right)\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{c^2}+\frac{\int \cos(x)\,dx}{c}$$

$$= -\frac{bx}{c^2}+\frac{\sin(x)}{c}+\frac{\left(b^2-ac+\frac{b^3}{\sqrt{b^2-4ac}}-\frac{3abc}{\sqrt{b^2-4ac}}\right)\int \frac{1}{b+\sqrt{b^2-4ac}+2c\cos(x)}\,dx}{c^2}+\frac{\left(b^2-\right.}{}$$

$$= -\frac{bx}{c^2}+\frac{\sin(x)}{c}+\frac{\left(2\left(b^2-ac+\frac{b^3}{\sqrt{b^2-4ac}}-\frac{3abc}{\sqrt{b^2-4ac}}\right)\right)\text{Subst}\left(\int \frac{1}{b+2c+\sqrt{b^2-4ac}+\left(b-2c\right.}\right.}{c^2}$$

$$= -\frac{bx}{c^2}+\frac{2\left(b^2-ac-\frac{b^3}{\sqrt{b^2-4ac}}+\frac{3abc}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{c^2\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}}+\frac{2\left(b^2-\right.}{c}$$

Mathematica [A] time = 0.89, size = 309, normalized size = 1.03

$$\frac{-\frac{\sqrt{2}\left(b^2\sqrt{b^2-4ac}-ac\sqrt{b^2-4ac}-3abc+b^3\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}}+\frac{\sqrt{2}\left(b^2\sqrt{b^2-4ac}-ac\sqrt{b^2-4ac}+3abc-b^3\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}\right.}{\sqrt{2b\sqrt{b^2-4ac}+4c(\right.}\right.}{\sqrt{b^2-4ac}\sqrt{b\sqrt{b^2-4ac}+2c(a+c)-b^2}}}{c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[x]^3/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (-(b*x) - (Sqrt[2]*(b^3 - 3*a*b*c + b^2*Sqrt[b^2 - 4*a*c] - a*c*Sqrt[b^2 -
4*a*c])*ArcTanh[((b - 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*
(a + c) - 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a +
c) - b*Sqrt[b^2 - 4*a*c]]) + (Sqrt[2]*(-b^3 + 3*a*b*c + b^2*Sqrt[b^2 - 4*a*
c] - a*c*Sqrt[b^2 - 4*a*c])*ArcTanh[((-b + 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2
])/Sqrt[-2*b^2 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*
Sqrt[-b^2 + 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c]]) + c*Sin[x])/c^2
```

fricas [B] time = 3.22, size = 6529, normalized size = 21.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")

[Out] 1/4*(sqrt(2)*c^2*sqrt((a^2*b^4 - b^6 + 2*a^3*c^3 + (2*a^4 - 9*a^2*b^2)*c^2
- 2*(2*a^3*b^2 - 3*a*b^4)*c + (4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a
*b^2)*c^5 - (a^2*b^2 - b^4)*c^4)*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*
b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2
*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)
*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^
5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8)))/(4*a*c^7
+ (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4))*log(6
*a^5*b*c^3 + 4*(a^6*b - 2*a^4*b^3)*c^2 - (4*a^4*c^7 + (8*a^5 - a^3*b^2)*c^6
 + 2*(2*a^6 - 3*a^4*b^2)*c^5 - (a^5*b^2 - a^3*b^4)*c^4)*sqrt(-(a^4*b^6 - 2*
a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^
2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*
a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*
b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4
+ b^6)*c^8))*cos(x) - 2*(a^5*b^3 - a^3*b^5)*c + 1/2*sqrt(2)*((12*a^2*b*c^9
+ 7*(4*a^3*b - a*b^3)*c^8 + (20*a^4*b - 27*a^2*b^3 + b^5)*c^7 + (4*a^5*b -
13*a^3*b^3 + 9*a*b^5)*c^6 - (a^4*b^3 - 2*a^2*b^5 + b^7)*c^5)*sqrt(-(a^4*b^6
 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a
^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c
)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11
*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2
*b^4 + b^6)*c^8))*sin(x) - (12*a^4*b*c^5 + (20*a^5*b - 31*a^3*b^3)*c^4 + (8
*a^6*b - 33*a^4*b^3 + 27*a^2*b^5)*c^3 - 3*(2*a^5*b^3 - 5*a^3*b^5 + 3*a*b^7)
*c^2 + (a^4*b^5 - 2*a^2*b^7 + b^9)*c)*sin(x))*sqrt((a^2*b^4 - b^6 + 2*a^3*c
^3 + (2*a^4 - 9*a^2*b^2)*c^2 - 2*(2*a^3*b^2 - 3*a*b^4)*c + (4*a*c^7 + (8*a^
2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4)*sqrt(-(a^4*b^
6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*
a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*
c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 1
1*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^
2*b^4 + b^6)*c^8)))/(4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5
- (a^2*b^2 - b^4)*c^4)) - (a^5*b^4 - a^3*b^6 - 3*a^5*b^2*c^2 - 2*(a^6*b^2 -
 2*a^4*b^4)*c)*cos(x)) - sqrt(2)*c^2*sqrt((a^2*b^4 - b^6 + 2*a^3*c^3 + (2*a
^4 - 9*a^2*b^2)*c^2 - 2*(2*a^3*b^2 - 3*a*b^4)*c + (4*a*c^7 + (8*a^2 - b^2)*
c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4)*sqrt(-(a^4*b^6 - 2*a^2
*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 -
 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c
^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2
 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b
^6)*c^8)))/(4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^
2 - b^4)*c^4))*log(6*a^5*b*c^3 + 4*(a^6*b - 2*a^4*b^3)*c^2 - (4*a^4*c^7 + (
8*a^5 - a^3*b^2)*c^6 + 2*(2*a^6 - 3*a^4*b^2)*c^5 - (a^5*b^2 - a^3*b^4)*c^4)
*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^
```

```
4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b
^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11
+ 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (
a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*cos(x) - 2*(a^5*b^3 - a^3*b^5)*c - 1/2*sqr
t(2)*((12*a^2*b*c^9 + 7*(4*a^3*b - a*b^3)*c^8 + (20*a^4*b - 27*a^2*b^3 + b^
5)*c^7 + (4*a^5*b - 13*a^3*b^3 + 9*a*b^5)*c^6 - (a^4*b^3 - 2*a^2*b^5 + b^7)
*c^5)*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a
^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*
a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*
c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^
9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*sin(x) - (12*a^4*b*c^5 + (20*a^5*b -
31*a^3*b^3)*c^4 + (8*a^6*b - 33*a^4*b^3 + 27*a^2*b^5)*c^3 - 3*(2*a^5*b^3 -
5*a^3*b^5 + 3*a*b^7)*c^2 + (a^4*b^5 - 2*a^2*b^7 + b^9)*c)*sin(x))*sqrt((a^2
*b^4 - b^6 + 2*a^3*c^3 + (2*a^4 - 9*a^2*b^2)*c^2 - 2*(2*a^3*b^2 - 3*a*b^4)*
c + (4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4
)*c^4)*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*
a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3
*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)
*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c
^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8)))/(4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2
*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4)) - (a^5*b^4 - a^3*b^6 - 3*a^5*b^
2*c^2 - 2*(a^6*b^2 - 2*a^4*b^4)*c)*cos(x)) + sqrt(2)*c^2*sqrt((a^2*b^4 - b^
6 + 2*a^3*c^3 + (2*a^4 - 9*a^2*b^2)*c^2 - 2*(2*a^3*b^2 - 3*a*b^4)*c - (4*a*
c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4)*sq
rt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*
c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6
+ 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2
*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4
*b^2 - 2*a^2*b^4 + b^6)*c^8)))/(4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*
a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4))*log(-6*a^5*b*c^3 - 4*(a^6*b - 2*a^4*b^3)
*c^2 - (4*a^4*c^7 + (8*a^5 - a^3*b^2)*c^6 + 2*(2*a^6 - 3*a^4*b^2)*c^5 - (a^
5*b^2 - a^3*b^4)*c^4)*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 1
2*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 -
 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*
(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b
^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*cos(x) + 2*(a^5*b^3 -
 a^3*b^5)*c + 1/2*sqrt(2)*((12*a^2*b*c^9 + 7*(4*a^3*b - a*b^3)*c^8 + (20*a^
4*b - 27*a^2*b^3 + b^5)*c^7 + (4*a^5*b - 13*a^3*b^3 + 9*a*b^5)*c^6 - (a^4*b
^3 - 2*a^2*b^5 + b^7)*c^5)*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^
4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*
c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12
+ 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*
a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*sin(x) + (12*a^4
*b*c^5 + (20*a^5*b - 31*a^3*b^3)*c^4 + (8*a^6*b - 33*a^4*b^3 + 27*a^2*b^5)*
c^3 - 3*(2*a^5*b^3 - 5*a^3*b^5 + 3*a*b^7)*c^2 + (a^4*b^5 - 2*a^2*b^7 + b^9)
```

```
*c)*sin(x))*sqrt((a^2*b^4 - b^6 + 2*a^3*c^3 + (2*a^4 - 9*a^2*b^2)*c^2 - 2*(
2*a^3*b^2 - 3*a*b^4)*c - (4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)
*c^5 - (a^2*b^2 - b^4)*c^4)*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c
^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)
*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12
 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3
*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8)))/(4*a*c^7 + (8*
a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4)) + (a^5*b^4
 - a^3*b^6 - 3*a^5*b^2*c^2 - 2*(a^6*b^2 - 2*a^4*b^4)*c)*cos(x)) - sqrt(2)*c
^2*sqrt((a^2*b^4 - b^6 + 2*a^3*c^3 + (2*a^4 - 9*a^2*b^2)*c^2 - 2*(2*a^3*b^2
 - 3*a*b^4)*c - (4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a
^2*b^2 - b^4)*c^4)*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(
a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*
(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*
a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2
+ 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8)))/(4*a*c^7 + (8*a^2 - b^2
)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4))*log(-6*a^5*b*c^3 -
4*(a^6*b - 2*a^4*b^3)*c^2 - (4*a^4*c^7 + (8*a^5 - a^3*b^2)*c^6 + 2*(2*a^6 -
 3*a^4*b^2)*c^5 - (a^5*b^2 - a^3*b^4)*c^4)*sqrt(-(a^4*b^6 - 2*a^2*b^8 + b^1
0 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^
4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*
a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^
10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*
cos(x) + 2*(a^5*b^3 - a^3*b^5)*c - 1/2*sqrt(2)*((12*a^2*b*c^9 + 7*(4*a^3*b
- a*b^3)*c^8 + (20*a^4*b - 27*a^2*b^3 + b^5)*c^7 + (4*a^5*b - 13*a^3*b^3 +
9*a*b^5)*c^6 - (a^4*b^3 - 2*a^2*b^5 + b^7)*c^5)*sqrt(-(a^4*b^6 - 2*a^2*b^8
+ b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a
^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 +
 (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^
4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c
^8))*sin(x) + (12*a^4*b*c^5 + (20*a^5*b - 31*a^3*b^3)*c^4 + (8*a^6*b - 33*a
^4*b^3 + 27*a^2*b^5)*c^3 - 3*(2*a^5*b^3 - 5*a^3*b^5 + 3*a*b^7)*c^2 + (a^4*b
^5 - 2*a^2*b^7 + b^9)*c)*sin(x))*sqrt((a^2*b^4 - b^6 + 2*a^3*c^3 + (2*a^4 -
 9*a^2*b^2)*c^2 - 2*(2*a^3*b^2 - 3*a*b^4)*c - (4*a*c^7 + (8*a^2 - b^2)*c^6
+ 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4)*sqrt(-(a^4*b^6 - 2*a^2*b^8
 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*
a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13
+ (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b
^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*
c^8)))/(4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 -
b^4)*c^4)) + (a^5*b^4 - a^3*b^6 - 3*a^5*b^2*c^2 - 2*(a^6*b^2 - 2*a^4*b^4)*c
)*cos(x)) - 4*b*x + 4*c*sin(x))/c^2
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")

[Out] Timed out

maple [B] time = 0.11, size = 2503, normalized size = 8.37

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(cos(x)^3/(a+b*cos(x)+c*cos(x)^2),x)

```
[Out] 1/c^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*a
rctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^4-1/
c^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arc
tan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^4+5/c*b/
(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh
((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2-2/c^2/(-
4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((
-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b^3-5/c*b/(-
4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a
-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2+2/c^2/(-4*a*
c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c
)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a*b^3+1/c^2/(a-b+c)/
(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*
a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2*b+1/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/((
(-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+
b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3+1/c^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*
a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^
2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2*b^2+1/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(
a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c)
)^(1/2))*a+1/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c
)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a-2/c/(-4*a*c+b^2)^(
1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(
1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^3+1/c^2/(a-b+c)/(((-4*a*
c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(
1/2)+a-c)*(a-b+c))^(1/2))*a^2*b+2/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^
2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)
+a-c)*(a-b+c))^(1/2))*a^3-2/c^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^
(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))
*a*b^2-2/c^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c
)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a*b^2-1/c/(a-b+c)/((
(-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+
b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2+2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+
```

```
b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/
2)+a-c)*(a-b+c))^(1/2))*a^2+1/c^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c)
)^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2
))*b^3+1/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c
)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2+1/c^2/(a-b+c)/((
(-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+
b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+
b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(
1/2)-a+c)*(a-b+c))^(1/2))*a^2-1/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c)
)^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2
))*b^2+2/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1
/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a*b
^2+1/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(
1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2-2/c/(-4*a*c+b^2)^(1/2)
/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*
x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b^2-1/c^2/(-4*a*c+b^2)^(1/2)
/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)
/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2*b^2+2/c*tan(1/2*x)/(tan(1/2*
x)^2+1)-2/c^2*b*arctan(tan(1/2*x))+3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b
^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1
/2)-a+c)*(a-b+c))^(1/2))*a*b-3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1
/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)
*(a-b+c))^(1/2))*a*b-1/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+
c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-
b+c))^(1/2))*b^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{-2\,c^2 \int \frac{2\left(b^3-abc\right)\cos(3\,x)^2+4\left(2\,a^2b+abc\right)\cos(2\,x)^2+2\left(b^3-abc\right)\cos(x)^2+2\left(b^3-abc\right)\sin(3\,x)^2+4\left(2\,a^2b+abc\right)\sin(2\,x)^2+2\left(4\,ab^2-ac^2-\left(2\,a^2-b^2\right)c\right)s}{c^4\cos(4\,x)^2+4\,b^2c^2\cos(3\,x)^2+4\,b^2c^2\cos(x)^2+c^4\sin(4\,x)^2+4\,b^2c^2\sin(3\,x)^2+4\,b^2c^2\sin(x)^2+4\,bc^3\cos(x)+c^4+4\left(4\,a^2c^2+4\,a\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] -(c^2*integrate(-2*(2*(b^3 - a*b*c)*cos(3*x)^2 + 4*(2*a^2*b + a*b*c)*cos(2*
x)^2 + 2*(b^3 - a*b*c)*cos(x)^2 + 2*(b^3 - a*b*c)*sin(3*x)^2 + 4*(2*a^2*b +
 a*b*c)*sin(2*x)^2 + 2*(4*a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*sin(2*x)*sin(x)
+ 2*(b^3 - a*b*c)*sin(x)^2 + (2*a*b*c*cos(2*x) + (b^2*c - a*c^2)*cos(3*x) +
 (b^2*c - a*c^2)*cos(x))*cos(4*x) + (b^2*c - a*c^2 + 2*(4*a*b^2 - a*c^2 - (
2*a^2 - b^2)*c)*cos(2*x) + 4*(b^3 - a*b*c)*cos(x))*cos(3*x) + 2*(a*b*c + (4
*a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*cos(x))*cos(2*x) + (b^2*c - a*c^2)*cos(x)
 + (2*a*b*c*sin(2*x) + (b^2*c - a*c^2)*sin(3*x) + (b^2*c - a*c^2)*sin(x))*s
in(4*x) + 2*((4*a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*sin(2*x) + 2*(b^3 - a*b*c)
*sin(x))*sin(3*x))/(c^4*cos(4*x)^2 + 4*b^2*c^2*cos(3*x)^2 + 4*b^2*c^2*cos(x
```

```
)^2 + c^4*sin(4*x)^2 + 4*b^2*c^2*sin(3*x)^2 + 4*b^2*c^2*sin(x)^2 + 4*b*c^3*
cos(x) + c^4 + 4*(4*a^2*c^2 + 4*a*c^3 + c^4)*cos(2*x)^2 + 4*(4*a^2*c^2 + 4*
a*c^3 + c^4)*sin(2*x)^2 + 8*(2*a*b*c^2 + b*c^3)*sin(2*x)*sin(x) + 2*(2*b*c^
3*cos(3*x) + 2*b*c^3*cos(x) + c^4 + 2*(2*a*c^3 + c^4)*cos(2*x))*cos(4*x) +
4*(2*b^2*c^2*cos(x) + b*c^3 + 2*(2*a*b*c^2 + b*c^3)*cos(2*x))*cos(3*x) + 4*
(2*a*c^3 + c^4 + 2*(2*a*b*c^2 + b*c^3)*cos(x))*cos(2*x) + 4*(b*c^3*sin(3*x)
 + b*c^3*sin(x) + (2*a*c^3 + c^4)*sin(2*x))*sin(4*x) + 8*(b^2*c^2*sin(x) +
(2*a*b*c^2 + b*c^3)*sin(2*x))*sin(3*x)), x) + b*x - c*sin(x))/c^2
```

mupad [B] time = 12.68, size = 29362, normalized size = 98.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(x)^3/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] sin(x)/c - atan((((((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^5*c^
7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^3*c^
8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b*c^8
 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2*b^4
*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 23*a^
4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 - (8192*tan(x/2)*((b^8 - a^2*b^6 + 8*a^4*c^
4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a
*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*
a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^
3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7
+ 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*
c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*(8*a*c^12 - 16*a^2*c^11 - 32*a^3
*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9 + 8*b
^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46*a*b^4*c^
8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*a^4*b*c^8
 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6 - 68*a^3
*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*b*c^11))/
c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2)
 + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3
*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/
2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2
))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c
^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) +
 (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2*b^4*c^7
 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*b^2*c^8
+ 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*b^7*c^3
+ 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2*b^2*c^7
 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3 + 2*a^2
*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a^3*b^5*c
```

^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c^3 - 27*
a^5*b^2*c^4))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c -
b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^
4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c
- b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c
^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*
c^5)))^(1/2) + (8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c^4 -
4*b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16*a*b
^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b*c^4
+ 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b^
5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 +
4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b
^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*
a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b
^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*
c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/
2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a
^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 +
a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) - (8192*tan(x/2)*(5*a*b^8 + b^8*c - b^
9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a
*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*
b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a
^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c
^2 + 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*
c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2
*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*
a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a
c - b^2)^3)^(1/2))/(2(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^
6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b
^2*c^5)))^(1/2)*1i - (((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^
5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^
3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b
*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2
*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 2
3*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 + (8192*tan(x/2)*((b^8 - a^2*b^6 + 8*a^
4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-
(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 -
10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b
^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*
c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*
b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*(8*a*c^12 - 16*a^2*c^11 - 32
*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9 +
8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46*a*b^
4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*a^4*b

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*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6 - 68
*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*b*c^1
1))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(
1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38
*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)
^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^
(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b
^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/
2) - (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2*b^4
*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*b^2*
c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*b^7*
c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2*b^2
*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3 + 2
*a^2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a^3*b
^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c^3 -
 27*a^5*b^2*c^4))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a
*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^
2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4
*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*
a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b
^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*
b^2*c^5)))^(1/2) + (8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c
^4 - 4*b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16
*a*b^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b
*c^4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^
2*b^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^
3 + 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a
^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4
+ 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c
 - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*
b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)
^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 +
16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^
6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) + (8192*tan(x/2)*(5*a*b^8 + b^8*c
- b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 -
 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c -
a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 -
18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b
^2*c^2 + 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(
4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33
*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(
-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-
(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6
- b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a
^3*b^2*c^5)))^(1/2)*1i)/((((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 1
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2*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*
a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a
^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40
*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5
 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 - (8192*tan(x/2)*((b^8 - a^2*b^6 +
8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^
3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c
^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c
 - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*
a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*
a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*(8*a*c^12 - 16*a^2*c^11
- 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c
^9 + 8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46*
a*b^4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*a
^4*b*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6
- 68*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*b
*c^11))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^
3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2
- 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2
)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)
^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8
*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))
^(1/2) + (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2
*b^4*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*
b^2*c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*
b^7*c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2
*b^2*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3
 + 2*a^2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a
^3*b^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c
^3 - 27*a^5*b^2*c^4))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-
(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 3
3*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*
(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(
-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6
 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*
a^3*b^2*c^5)))^(1/2) + (8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b
^6*c^4 - 4*b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3
+ 16*a*b^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a
^5*b*c^4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 -
3*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^
4*c^3 + 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 -
20*a^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*
c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4
*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 1
0*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2
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)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^
7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^
2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) - (8192*tan(x/2)*(5*a*b^8 + b^
8*c - b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c
^2 - 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*
c - a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^
4 - 18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a
^5*b^2*c^2 + 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5
*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2)
+ 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c
^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*
c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*
c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 -
 8*a^3*b^2*c^5)))^(1/2) + (((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 -
12*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31
*a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*
a^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 4
0*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^
5 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 + (8192*tan(x/2)*((b^8 - a^2*b^6 +
 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b
^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*
c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*
c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32
*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32
*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*(8*a*c^12 - 16*a^2*c^11
 - 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*
c^9 + 8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46
*a*b^4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*
a^4*b*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6
 - 68*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*
b*c^11))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)
^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2
 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^
2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2
)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 -
8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5))
)^(1/2) - (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 +
2*b^4*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a
*b^2*c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a
*b^7*c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^
2*b^2*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^
3 + 2*a^2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*
a^3*b^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*
c^3 - 27*a^5*b^2*c^4))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(
-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) +
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33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2
*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*
(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^
6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8
*a^3*b^2*c^5)))^(1/2) + (8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 +
b^6*c^4 - 4*b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3
 + 16*a*b^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*
a^5*b*c^4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 -
 3*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b
^4*c^3 + 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 -
 20*a^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4
*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(
4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 -
10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^
2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c
^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b
^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) + (8192*tan(x/2)*(5*a*b^8 + b
^8*c - b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*
c^2 - 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3
*c - a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c
^4 - 18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*
a^5*b^2*c^2 + 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^
5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2)
 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*
c^2*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b
*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4
*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4
- 8*a^3*b^2*c^5)))^(1/2) - (16384*(a^7*b + a^3*b^5 - 4*a^4*b^4 + 6*a^5*b^3
- 4*a^6*b^2 - a^3*b^4*c + 2*a^4*b^3*c - 2*a^5*b^2*c + a^4*b^2*c^2 + a^6*b*c
))/c^4))*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 + b^5*(-(4*a*c - b^2)^3)^(
1/2) + 8*a^3*b^4*c - a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38
*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)
^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 2*a^3*b*c*(-(4*a*c - b^2)^3)^
(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b
^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/
2)*2i - atan((((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^5*c^7 +
 b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^3*c^8 -
 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b*c^8 -
28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2*b^4*c^
6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 23*a^4*b
^2*c^6 + 2*a^4*b^3*c^5))/c^4 - (8192*tan(x/2)*((b^8 - a^2*b^6 + 8*a^4*c^4 +
 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c
- b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b
^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^
(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 1
```

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6*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6
 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*(8*a*c^12 - 16*a^2*c^11 - 32*a^3*c^
10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9 + 8*b^5*
c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46*a*b^4*c^8 -
 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*a^4*b*c^8 -
80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6 - 68*a^3*b^
2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*b*c^11))/c^4
)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) +
8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^
2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2)
+ 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/
(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7
+ 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) + (8
192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2*b^4*c^7 -
6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*b^2*c^8 + 2
4*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*b^7*c^3 + 2
*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2*b^2*c^7 -
99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3 + 2*a^2*b^
7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a^3*b^5*c^3
- 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c^3 - 27*a^5
*b^2*c^4))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^
2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c
^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c -
b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b
^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4
- 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5
)))^(1/2) + (8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c^4 - 4*
b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16*a*b^7*
c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b*c^4 +
8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b^5*c
^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 + 4*a
^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b^2*
c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5
*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)
^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c -
 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2)
- 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*
c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2
*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) - (8192*tan(x/2)*(5*a*b^8 + b^8*c - b^9 -
 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a*b^
6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*b*c
^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a^3*
b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c^2
+ 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c -
 b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^
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4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c
 - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c
- b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c
^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*
c^5)))^(1/2)*1i - (((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^5*c
^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^3*c
^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b*c^
8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2*b^
4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 23*a
^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 + (8192*tan(x/2)*((b^8 - a^2*b^6 + 8*a^4*c
^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*
a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10
*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)
^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7
 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2
*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*(8*a*c^12 - 16*a^2*c^11 - 32*a^
3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9 + 8*
b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46*a*b^4*c
^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*a^4*b*c^
8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6 - 68*a^
3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*b*c^11))
/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2
) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^
3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1
/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/
2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*
c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)
- (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2*b^4*c^
7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*b^2*c^8
 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*b^7*c^3
 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2*b^2*c^
7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3 + 2*a^
2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a^3*b^5*
c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c^3 - 27
*a^5*b^2*c^4))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c
- b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b
^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*
c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c
 - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*
c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2
*c^5)))^(1/2) + (8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c^4
- 4*b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16*a*
b^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b*c^
4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b
^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 +
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4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) + (8192*tan(x/2)*(5*a*b^8 + b^8*c - b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c^2 + 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*1i)/((((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 - (8192*tan(x/2)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*(8*a*c^12 - 16*a^2*c^11 - 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9 + 8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46*a*b^4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*a^4*b*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6 - 68*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*b*c^11))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) + (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2*b^4*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*b^2*c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*b^7*c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2*b^

2*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c^3 - 27*a^5*b^2*c^4))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) + (8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c^4 - 4*b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16*a*b^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b*c^4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 + 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) - (8192*tan(x/2)*(5*a*b^8 + b^8*c - b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c^2 + 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) + (((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 + (8192*tan(x/2)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*(8*a*c^12 - 16*a^2*c^11 - 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9

+ 8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46*a*
b^4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*a^4
*b*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6 -
68*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*b*c
^11))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)
^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 -
38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^
3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3
)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a
*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(
1/2) - (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2*b
^4*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*b^
2*c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*b^
7*c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2*b
^2*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3 +
2*a^2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a^3
*b^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c^3
- 27*a^5*b^2*c^4))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4
*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*
a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-
(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(
4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 -
b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^
3*b^2*c^5)))^(1/2) + (8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6
*c^4 - 4*b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 +
16*a*b^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5
*b*c^4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*
a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*
c^3 + 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20
*a^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^
4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a
*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*
a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^
3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7
+ 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*
c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2) + (8192*tan(x/2)*(5*a*b^8 + b^8*
c - b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2
- 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c
- a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4
- 18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5
*b^2*c^2 + 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(
-(4*a*c - b^2)^3)^(1/2) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) +
33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2
*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*
(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^

```
6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8
*a^3*b^2*c^5)))^(1/2) - (16384*(a^7*b + a^3*b^5 - 4*a^4*b^4 + 6*a^5*b^3 - 4
*a^6*b^2 - a^3*b^4*c + 2*a^4*b^3*c - 2*a^5*b^2*c + a^4*b^2*c^2 + a^6*b*c))/
c^4))*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^(1/2
) + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^(1/2) + 33*a^2*b^4*c^2 - 38*a^
3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1
/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2) - 2*a^3*b*c*(-(4*a*c - b^2)^3)^(1/
2))/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*
c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^(1/2)*
2i - (2*b*atan(((b*((8192*tan(x/2)*(5*a*b^8 + b^8*c - b^9 - 10*a^2*b^7 + 10
*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a*b^6*c^2 - 20*a^2*b
^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*b*c^2 - 2*a^6*b^2*c
 + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 5*a^3*
b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c^2 + 2*a*b^7*c))/c^
4 - (b*((8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c^4 - 4*b^7*
c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16*a*b^7*c^2
+ a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b*c^4 + 8*a^
6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b^5*c^3 -
 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 + 4*a^3*b
^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b^2*c^3
- 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4 + (b*((b*((8192*(4*a^2*c^10 - 4*a^3*c^9
- 20*a^4*c^8 - 12*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5
*a*b^2*c^9 + 31*a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*
a^2*b*c^9 - 64*a^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*
a^2*b^3*c^7 - 40*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6
 - 5*a^3*b^4*c^5 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 - (b*tan(x/2)*(8*a*
c^12 - 16*a^2*c^11 - 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6
*b^3*c^10 - 8*b^4*c^9 + 8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 -
 50*a*b^3*c^9 + 46*a*b^4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 +
 88*a^3*b*c^9 - 8*a^4*b*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c
^7 - 2*a^2*b^5*c^6 - 68*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a
^4*b^2*c^7 - 24*a*b*c^11)*8192i)/c^6)*1i)/c^2 + (8192*tan(x/2)*(2*a^3*c^8 -
 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2*b^4*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8
*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*b^2*c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^
6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*b^7*c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7
 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2*b^2*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b
^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 37*a^3*b^2*c^6 -
122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*
b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c^3 - 27*a^5*b^2*c^4))/c^4)*1i)/c^2)*
1i)/c^2))/c^2 + (b*((8192*tan(x/2)*(5*a*b^8 + b^8*c - b^9 - 10*a^2*b^7 + 10
*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a*b^6*c^2 - 20*a^2*b
^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*b*c^2 - 2*a^6*b^2*c
 + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 5*a^3*
b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c^2 + 2*a*b^7*c))/c^
4 + (b*((8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c^4 - 4*b^7*
```

c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16*a*b^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b*c^4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 + 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4 + (b*((b*((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 + (b*tan(x/2)*(8*a*c^12 - 16*a^2*c^11 - 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9 + 8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46*a*b^4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*a^4*b*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6 - 68*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*b*c^11)*8192i)/c^6)*1i)/c^2 - (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5*c^6 + 10*a^6*c^5 + 2*b^4*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c^3 - 2*b^9*c^2 - 8*a*b^2*c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 - 50*a*b^6*c^4 + 14*a*b^7*c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 - 22*a^5*b*c^5 + 23*a^2*b^2*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5*c^4 - 24*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 + 59*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 14*a^4*b^4*c^3 - 27*a^5*b^2*c^4))/c^4)*1i)/c^2)*1i)/c^2))/c^2)/((16384*(a^7*b + a^3*b^5 - 4*a^4*b^4 + 6*a^5*b^3 - 4*a^6*b^2 - a^3*b^4*c + 2*a^4*b^3*c - 2*a^5*b^2*c + a^4*b^2*c^2 + a^6*b*c))/c^4 + (b*((8192*tan(x/2)*(5*a*b^8 + b^8*c - b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c^2 + 2*a*b^7*c))/c^4 - (b*((8192*(2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c^4 - 4*b^7*c^3 + 6*b^8*c^2 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16*a*b^7*c^2 + a^2*b^7*c - 5*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b*c^4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 + 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4 + (b*((b*((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 - (b*tan(x/2)*(8*a*c^12 - 16*a^2*c^11 - 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9 + 8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 + 46

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*a*b^4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 - 8*
a^4*b*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*c^6
 - 68*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24*a*
b*c^11)*8192i)/c^6)*1i)/c^2 + (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*a^5
*c^6 + 10*a^6*c^5 + 2*b^4*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^8*c
^3 - 2*b^9*c^2 - 8*a*b^2*c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^5 -
 50*a*b^6*c^4 + 14*a*b^7*c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6 -
22*a^5*b*c^5 + 23*a^2*b^2*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*b^5
*c^4 - 24*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5 +
59*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^4*b
^3*c^4 + 14*a^4*b^4*c^3 - 27*a^5*b^2*c^4))/c^4)*1i)/c^2)*1i)/c^2)*1i)/c^2 -
 (b*((8192*tan(x/2)*(5*a*b^8 + b^8*c - b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^
4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b
^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^
3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^
4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c^2 + 2*a*b^7*c))/c^4 + (b*((8192*(
2*a^5*c^5 - a^4*c^6 - 3*b^9*c + 3*a^6*c^4 + b^6*c^4 - 4*b^7*c^3 + 6*b^8*c^2
 - 5*a*b^4*c^5 + 23*a*b^5*c^4 - 38*a*b^6*c^3 + 16*a*b^7*c^2 + a^2*b^7*c - 5
*a^3*b^6*c + 6*a^4*b*c^5 + 2*a^4*b^5*c + 10*a^5*b*c^4 + 8*a^6*b*c^3 + 4*a^2
*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b^5*c^3 - 41*a^2*b^6*c^2
 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 + 4*a^3*b^5*c^2 - 24*a^4
*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b^2*c^3 - 10*a^5*b^3*c^
2 + 5*a*b^8*c))/c^4 + (b*((b*((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 -
12*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31
*a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*
a^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 4
0*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^
5 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 + (b*tan(x/2)*(8*a*c^12 - 16*a^2*c
^11 - 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b
^4*c^9 + 8*b^5*c^8 - 6*b^6*c^7 + 2*b^7*c^6 + 36*a*b^2*c^10 - 50*a*b^3*c^9 +
 46*a*b^4*c^8 - 14*a*b^5*c^7 - 2*a*b^6*c^6 + 72*a^2*b*c^10 + 88*a^3*b*c^9 -
 8*a^4*b*c^8 - 80*a^2*b^2*c^9 + 2*a^2*b^3*c^8 + 24*a^2*b^4*c^7 - 2*a^2*b^5*
c^6 - 68*a^3*b^2*c^8 + 10*a^3*b^3*c^7 + 2*a^3*b^4*c^6 - 14*a^4*b^2*c^7 - 24
*a*b*c^11)*8192i)/c^6)*1i)/c^2 - (8192*tan(x/2)*(2*a^3*c^8 - 2*a^4*c^7 + 6*
a^5*c^6 + 10*a^6*c^5 + 2*b^4*c^7 - 6*b^5*c^6 + 8*b^6*c^5 - 8*b^7*c^4 + 6*b^
8*c^3 - 2*b^9*c^2 - 8*a*b^2*c^8 + 24*a*b^3*c^7 - 38*a*b^4*c^6 + 56*a*b^5*c^
5 - 50*a*b^6*c^4 + 14*a*b^7*c^3 + 2*a*b^8*c^2 + 18*a^3*b*c^7 + 12*a^4*b*c^6
 - 22*a^5*b*c^5 + 23*a^2*b^2*c^7 - 99*a^2*b^3*c^6 + 93*a^2*b^4*c^5 + 7*a^2*
b^5*c^4 - 24*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 37*a^3*b^2*c^6 - 122*a^3*b^3*c^5
 + 59*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 2*a^3*b^6*c^2 + 11*a^4*b^2*c^5 + 15*a^
4*b^3*c^4 + 14*a^4*b^4*c^3 - 27*a^5*b^2*c^4))/c^4)*1i)/c^2)*1i)/c^2)*1i)/c^
2)))/c^2
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)**3/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Timed out
```

3.15 $\int \frac{\cos^2(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=255

$$-\frac{2\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{c\sqrt{-\sqrt{b^2-4ac}+b-2c}\,\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{2\left(\frac{b^2-2ac}{\sqrt{b^2-4ac}}+b\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{c\sqrt{\sqrt{b^2-4ac}+b-2c}\,\sqrt{\sqrt{b^2-4ac}+b+2c}}+\frac{x}{c}$$

```
[Out] x/c-2*arctan((b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c-(-4*a*c+b^2
)^(1/2))^(1/2))*(b+(2*a*c-b^2)/(-4*a*c+b^2)^(1/2))/c/(b-2*c-(-4*a*c+b^2)^(1
/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)-2*arctan((b-2*c+(-4*a*c+b^2)^(1
/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2))*(b+(-2*a*c+b^2)/(-4
*a*c+b^2)^(1/2))/c/(b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/
2))^(1/2)
```

Rubi [A] time = 1.26, antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {3257, 3293, 2659, 205}

$$-\frac{2\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{c\sqrt{-\sqrt{b^2-4ac}+b-2c}\,\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{2\left(\frac{b^2-2ac}{\sqrt{b^2-4ac}}+b\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{c\sqrt{\sqrt{b^2-4ac}+b-2c}\,\sqrt{\sqrt{b^2-4ac}+b+2c}}+\frac{x}{c}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[x]^2/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] x/c - (2*(b - (b^2 - 2*a*c)/Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c - Sqrt[
b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/(c*Sqrt[b - 2*c
 - Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]) - (2*(b + (b^2 - 2
*a*c)/Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Tan[x/2]
)/Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]])/(c*Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*
Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
```

```
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3257

```
Int[cos[(d_.) + (e_.)*(x_)]^(m_.)*((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b
_.) + cos[(d_.) + (e_.)*(x_)]^(n2_.)*(c_.))^(p_), x_Symbol] :> Int[ExpandTr
ig[cos[d + e*x]^m*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n))^p, x], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && NeQ[b^2 - 4*a*c, 0] && Integ
ersQ[m, n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rubi steps

$$\int \frac{\cos^2(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(\frac{1}{c}+\frac{-a-b\cos(x)}{c\left(a+b\cos(x)+c\cos^2(x)\right)}\right)dx$$

$$= \frac{x}{c}+\frac{\int \frac{-a-b\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{c}$$

$$= \frac{x}{c}-\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\int \frac{1}{b-\sqrt{b^2-4ac}+2c\cos(x)}\,dx}{c}-\frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\int \frac{1}{b+\sqrt{b^2-4ac}+2c\cos(x)}}{c}$$

$$= \frac{x}{c}-\frac{\left(2\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\right)\text{Subst}\left(\int \frac{1}{b+2c-\sqrt{b^2-4ac}+\left(b-2c-\sqrt{b^2-4ac}\right)x^2}\,dx, x, \tan\left(\frac{x}{2}\right)\right)}{c}-$$

$$= \frac{x}{c}-\frac{2\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{c\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}}-\frac{2\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\right.}{c\sqrt{b-2c+\sqrt{b^2-4ac}}\,\sqrt{}}$$

Mathematica [A] time = 0.59, size = 264, normalized size = 1.04

$$\frac{\frac{\sqrt{2}\left(b\sqrt{b^2-4ac}-2ac+b^2\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}}-\frac{\sqrt{2}\left(b\sqrt{b^2-4ac}+2ac-b^2\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}-b+2c\right)}{\sqrt{2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\sqrt{b\sqrt{b^2-4ac}+2c(a+c)-b^2}}+x}{c}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[x]^2/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (x + (Sqrt[2]*(b^2 - 2*a*c + b*Sqrt[b^2 - 4*a*c])*ArcTanh[((b - 2*c + Sqrt[
b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) - 2*b*Sqrt[b^2 - 4*a*c]]]
)/(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a + c) - b*Sqrt[b^2 - 4*a*c]]) - (Sqr
t[2]*(-b^2 + 2*a*c + b*Sqrt[b^2 - 4*a*c])*ArcTanh[((-b + 2*c + Sqrt[b^2 - 4
*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt
[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c]]))/c
```

fricas [B] time = 2.72, size = 4983, normalized size = 19.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(2)*c*sqrt((a^2*b^2 - b^4 - 2*a^2*c^2 - 2*(a^3 - 2*a*b^2)*c - (4*
a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2)*
sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(
4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b
^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 +
b^6)*c^4)))/(4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)*c^3 - (a^2*b
^2 - b^4)*c^2))*log(4*a^3*b*c^2 - (4*a^3*c^5 + (8*a^4 - a^2*b^2)*c^4 + 2*(2
*a^5 - 3*a^3*b^2)*c^3 - (a^4*b^2 - a^2*b^4)*c^2)*sqrt(-(a^4*b^2 - 2*a^2*b^4
 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c
^8 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3
*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4))*cos(x) + 2*(a^4
*b - a^2*b^3)*c + 1/2*sqrt(2)*((8*a^2*c^7 + 6*(4*a^3 - a*b^2)*c^6 + (24*a^4
 - 22*a^2*b^2 + b^4)*c^5 + 2*(4*a^5 - 9*a^3*b^2 + 4*a*b^4)*c^4 - (2*a^4*b^2
 - 3*a^2*b^4 + b^6)*c^3)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*b^2*c^2 +
 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a^3 - a*b^2)*
c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^5
- (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4))*sin(x) + (8*a^2*b^2*c^3 + 2*(2*a^3*b^2
- 3*a*b^4)*c^2 - (a^2*b^4 - b^6)*c)*sin(x))*sqrt((a^2*b^2 - b^4 - 2*a^2*c^2
 - 2*(a^3 - 2*a*b^2)*c - (4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)
*c^3 - (a^2*b^2 - b^4)*c^2)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*b^2*c^
```

```
2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a^3 - a*b^
2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c
^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4)))/(4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2
*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2)) + (a^4*b^2 - a^2*b^4 + 2*a^3*b^
2*c)*cos(x)) - sqrt(2)*c*sqrt((a^2*b^2 - b^4 - 2*a^2*c^2 - 2*(a^3 - 2*a*b^2
)*c - (4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b
^4)*c^2)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*
b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 -
 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a
^2*b^4 + b^6)*c^4)))/(4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)*c^3
 - (a^2*b^2 - b^4)*c^2))*log(4*a^3*b*c^2 - (4*a^3*c^5 + (8*a^4 - a^2*b^2)*c
^4 + 2*(2*a^5 - 3*a^3*b^2)*c^3 - (a^4*b^2 - a^2*b^4)*c^2)*sqrt(-(a^4*b^2 -
2*a^2*b^4 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2
 - b^2)*c^8 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4
*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4))*cos(x)
 + 2*(a^4*b - a^2*b^3)*c - 1/2*sqrt(2)*((8*a^2*c^7 + 6*(4*a^3 - a*b^2)*c^6
+ (24*a^4 - 22*a^2*b^2 + b^4)*c^5 + 2*(4*a^5 - 9*a^3*b^2 + 4*a*b^4)*c^4 - (
2*a^4*b^2 - 3*a^2*b^4 + b^6)*c^3)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*
b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a^3
- a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*
b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4))*sin(x) + (8*a^2*b^2*c^3 + 2*(2
*a^3*b^2 - 3*a*b^4)*c^2 - (a^2*b^4 - b^6)*c)*sin(x))*sqrt((a^2*b^2 - b^4 -
2*a^2*c^2 - 2*(a^3 - 2*a*b^2)*c - (4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 -
 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a
^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a
^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2
*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4)))/(4*a*c^5 + (8*a^2 - b^2)*c
^4 + 2*(2*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2)) + (a^4*b^2 - a^2*b^4 +
 2*a^3*b^2*c)*cos(x)) + sqrt(2)*c*sqrt((a^2*b^2 - b^4 - 2*a^2*c^2 - 2*(a^3
- 2*a*b^2)*c + (4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)*c^3 - (a^
2*b^2 - b^4)*c^2)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3
*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a^3 - a*b^2)*c^7 + 2
*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*
b^2 - 2*a^2*b^4 + b^6)*c^4)))/(4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a
*b^2)*c^3 - (a^2*b^2 - b^4)*c^2))*log(-4*a^3*b*c^2 - (4*a^3*c^5 + (8*a^4 -
a^2*b^2)*c^4 + 2*(2*a^5 - 3*a^3*b^2)*c^3 - (a^4*b^2 - a^2*b^4)*c^2)*sqrt(-(
a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9
 + (16*a^2 - b^2)*c^8 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^
4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^
4))*cos(x) - 2*(a^4*b - a^2*b^3)*c + 1/2*sqrt(2)*((8*a^2*c^7 + 6*(4*a^3 - a
*b^2)*c^6 + (24*a^4 - 22*a^2*b^2 + b^4)*c^5 + 2*(4*a^5 - 9*a^3*b^2 + 4*a*b^
4)*c^4 - (2*a^4*b^2 - 3*a^2*b^4 + b^6)*c^3)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^
6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8 +
12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*
b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4))*sin(x) - (8*a^2*b^2*
```

```
c^3 + 2*(2*a^3*b^2 - 3*a*b^4)*c^2 - (a^2*b^4 - b^6)*c)*sin(x))*sqrt((a^2*b^
2 - b^4 - 2*a^2*c^2 - 2*(a^3 - 2*a*b^2)*c + (4*a*c^5 + (8*a^2 - b^2)*c^4 +
2*(2*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2)*sqrt(-(a^4*b^2 - 2*a^2*b^4 +
 b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8
 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a
^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4)))/(4*a*c^5 + (8*a^
2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2)) - (a^4*b^2 -
 a^2*b^4 + 2*a^3*b^2*c)*cos(x)) - sqrt(2)*c*sqrt((a^2*b^2 - b^4 - 2*a^2*c^2
 - 2*(a^3 - 2*a*b^2)*c + (4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)
*c^3 - (a^2*b^2 - b^4)*c^2)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*b^2*c^
2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a^3 - a*b^
2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c
^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4)))/(4*a*c^5 + (8*a^2 - b^2)*c^4 + 2*(2
*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2))*log(-4*a^3*b*c^2 - (4*a^3*c^5 +
 (8*a^4 - a^2*b^2)*c^4 + 2*(2*a^5 - 3*a^3*b^2)*c^3 - (a^4*b^2 - a^2*b^4)*c^
2)*sqrt(-(a^4*b^2 - 2*a^2*b^4 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c
)/(4*a*c^9 + (16*a^2 - b^2)*c^8 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^
2*b^2 + b^4)*c^6 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4
 + b^6)*c^4))*cos(x) - 2*(a^4*b - a^2*b^3)*c - 1/2*sqrt(2)*((8*a^2*c^7 + 6*
(4*a^3 - a*b^2)*c^6 + (24*a^4 - 22*a^2*b^2 + b^4)*c^5 + 2*(4*a^5 - 9*a^3*b^
2 + 4*a*b^4)*c^4 - (2*a^4*b^2 - 3*a^2*b^4 + b^6)*c^3)*sqrt(-(a^4*b^2 - 2*a^
2*b^4 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2 - b
^2)*c^8 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*(a^
5 - 3*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4))*sin(x) - (
8*a^2*b^2*c^3 + 2*(2*a^3*b^2 - 3*a*b^4)*c^2 - (a^2*b^4 - b^6)*c)*sin(x))*sq
rt((a^2*b^2 - b^4 - 2*a^2*c^2 - 2*(a^3 - 2*a*b^2)*c + (4*a*c^5 + (8*a^2 - b
^2)*c^4 + 2*(2*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2)*sqrt(-(a^4*b^2 - 2
*a^2*b^4 + b^6 + 4*a^2*b^2*c^2 + 4*(a^3*b^2 - a*b^4)*c)/(4*a*c^9 + (16*a^2
- b^2)*c^8 + 12*(2*a^3 - a*b^2)*c^7 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^6 + 4*
(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^5 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^4)))/(4*a*c
^5 + (8*a^2 - b^2)*c^4 + 2*(2*a^3 - 3*a*b^2)*c^3 - (a^2*b^2 - b^4)*c^2)) -
(a^4*b^2 - a^2*b^4 + 2*a^3*b^2*c)*cos(x)) - 4*x)/c
```

giac [B] time = 165.93, size = 9028, normalized size = 35.40

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] x/c + ((2*a^3*b^4 - 6*a^2*b^5 + 6*a*b^6 - 2*b^7 - 16*a^4*b^2*c + 48*a^3*b^3
*c - 44*a^2*b^4*c + 8*a*b^5*c + 4*b^6*c + 32*a^5*c^2 - 96*a^4*b*c^2 + 64*a^
3*b^2*c^2 + 32*a^2*b^3*c^2 - 30*a*b^4*c^2 - 2*b^5*c^2 + 64*a^4*c^3 - 128*a^
3*b*c^3 + 48*a^2*b^2*c^3 + 16*a*b^3*c^3 + 32*a^3*c^4 - 32*a^2*b*c^4 + 3*sqr
t(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*
```

```
a^3*b^2 - 2*(b^2 - 4*a*c)*a^3*b^2 - 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2
 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b^3 + 6*(b^2 - 4*a*c)*a^2*b^3
- 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 -
4*a*c)*a*b^4 - 6*(b^2 - 4*a*c)*a*b^4 + 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(
b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^5 + 2*(b^2 - 4*a*c)*b^5 - 12*
sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*
c)*a^4*c + 8*(b^2 - 4*a*c)*a^4*c + 20*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2
 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*b*c - 24*(b^2 - 4*a*c)*a^3*b*c
 + 26*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2
- 4*a*c)*a^2*b^2*c + 20*(b^2 - 4*a*c)*a^2*b^2*c - 28*sqrt(a^2 - a*b + b*c -
 c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^3*c - 6*sqrt(a^
2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^4*
c - 4*(b^2 - 4*a*c)*b^4*c - 56*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*
c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*c^2 + 16*(b^2 - 4*a*c)*a^3*c^2 + 32*s
qrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c
)*a^2*b*c^2 - 32*(b^2 - 4*a*c)*a^2*b*c^2 + 19*sqrt(a^2 - a*b + b*c - c^2 -
sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^2*c^2 + 14*(b^2 - 4*a*
c)*a*b^2*c^2 + 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c)
)*sqrt(b^2 - 4*a*c)*b^3*c^2 + 2*(b^2 - 4*a*c)*b^3*c^2 + 20*sqrt(a^2 - a*b +
 b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*c^3 + 8*(
b^2 - 4*a*c)*a^2*c^3 - 20*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a
 - b + c))*sqrt(b^2 - 4*a*c)*a*b*c^3 - 8*(b^2 - 4*a*c)*a*b*c^3)*c^2*abs(a -
 b + c) + (4*a^3*b^4*c - 4*a^2*b^5*c - 4*a*b^6*c + 4*b^7*c - 32*a^4*b^2*c^2
 + 32*a^3*b^3*c^2 + 40*a^2*b^4*c^2 - 32*a*b^5*c^2 - 8*b^6*c^2 + 64*a^5*c^3
- 64*a^4*b*c^3 - 128*a^3*b^2*c^3 + 64*a^2*b^3*c^3 + 68*a*b^4*c^3 + 4*b^5*c^
3 + 128*a^4*c^4 - 160*a^2*b^2*c^4 - 32*a*b^3*c^4 + 64*a^3*c^5 + 64*a^2*b*c^
5 - 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^4*b^2*c
 + 2*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*b^3*c
+ 8*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b^4*c -
 2*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^5*c - 5*
sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*b^6*c + 12*sqrt
(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^5*c^2 - 8*sqrt(a^
2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^4*b*c^2 - 49*sqrt(a^
2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*b^2*c^2 + sqrt(a^2
 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b^3*c^2 + 41*sqrt(a
^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^4*c^2 + 11*sqrt(a
^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*b^5*c^2 + 68*sqrt(a^2
 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^4*c^3 + 28*sqrt(a^2 -
 a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*b*c^3 - 93*sqrt(a^2 -
 a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b^2*c^3 - 64*sqrt(a^2
 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^3*c^3 - 11*sqrt(a^2
 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*b^4*c^3 + 36*sqrt(a^2 -
 a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*c^4 + 80*sqrt(a^2 - a
*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b*c^4 + 49*sqrt(a^2 - a
*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^2*c^4 + 5*sqrt(a^2 - a*
```

```
b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*b^3*c^4 - 20*sqrt(a^2 - a*b
+ b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*c^5 - 20*sqrt(a^2 - a*b +
b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*b*c^5 - 4*(b^2 - 4*a*c)*a^3*b^
2*c + 4*(b^2 - 4*a*c)*a^2*b^3*c + 4*(b^2 - 4*a*c)*a*b^4*c - 4*(b^2 - 4*a*c)
*b^5*c + 16*(b^2 - 4*a*c)*a^4*c^2 - 16*(b^2 - 4*a*c)*a^3*b*c^2 - 24*(b^2 -
4*a*c)*a^2*b^2*c^2 + 16*(b^2 - 4*a*c)*a*b^3*c^2 + 8*(b^2 - 4*a*c)*b^4*c^2 +
 32*(b^2 - 4*a*c)*a^3*c^3 - 36*(b^2 - 4*a*c)*a*b^2*c^3 - 4*(b^2 - 4*a*c)*b^
3*c^3 + 16*(b^2 - 4*a*c)*a^2*c^4 + 16*(b^2 - 4*a*c)*a*b*c^4)*abs(a - b + c)
*abs(c) + (2*a^4*b^3*c^2 - 6*a^3*b^4*c^2 + 6*a^2*b^5*c^2 - 2*a*b^6*c^2 - 8*
a^5*b*c^3 + 28*a^4*b^2*c^3 - 30*a^3*b^3*c^3 + 10*a^2*b^4*c^3 - 2*a*b^5*c^3
+ 2*b^6*c^3 - 16*a^5*c^4 + 24*a^4*b*c^4 - 4*a^3*b^2*c^4 + 6*a^2*b^3*c^4 - 6
*a*b^4*c^4 - 4*b^5*c^4 - 16*a^4*c^5 + 8*a^3*b*c^5 - 12*a^2*b^2*c^5 + 22*a*b
^3*c^5 + 2*b^4*c^5 + 16*a^3*c^6 - 24*a^2*b*c^6 - 12*a*b^2*c^6 + 16*a^2*c^7
+ 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 -
4*a*c)*a^4*b*c^2 - 2*(b^2 - 4*a*c)*a^4*b*c^2 - 5*sqrt(a^2 - a*b + b*c - c^2
 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*b^2*c^2 + 6*(b^2 -
4*a*c)*a^3*b^2*c^2 - 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a -
b + c))*sqrt(b^2 - 4*a*c)*a^2*b^3*c^2 - 6*(b^2 - 4*a*c)*a^2*b^3*c^2 + 5*sqr
t(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*
a*b^4*c^2 + 2*(b^2 - 4*a*c)*a*b^4*c^2 + 6*sqrt(a^2 - a*b + b*c - c^2 - sqrt
(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^4*c^3 - 4*(b^2 - 4*a*c)*a^4*
c^3 + 7*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^
2 - 4*a*c)*a^3*b*c^3 + 6*(b^2 - 4*a*c)*a^3*b*c^3 - 13*sqrt(a^2 - a*b + b*c
- c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b^2*c^3 - 2*(b
^2 - 4*a*c)*a^2*b^2*c^3 - 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*
(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^3*c^3 + 2*(b^2 - 4*a*c)*a*b^3*c^3 - 5*sq
rt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)
*b^4*c^3 - 2*(b^2 - 4*a*c)*b^4*c^3 + 22*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b
^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*c^4 - 4*(b^2 - 4*a*c)*a^3*c^
4 - 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2
- 4*a*c)*a^2*b*c^4 + 2*(b^2 - 4*a*c)*a^2*b*c^4 + 23*sqrt(a^2 - a*b + b*c -
c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^2*c^4 - 2*(b^2 -
 4*a*c)*a*b^2*c^4 + 6*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b
 + c))*sqrt(b^2 - 4*a*c)*b^3*c^4 + 4*(b^2 - 4*a*c)*b^3*c^4 - 38*sqrt(a^2 -
a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*c^5
+ 4*(b^2 - 4*a*c)*a^2*c^5 - 7*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c
)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b*c^5 - 6*(b^2 - 4*a*c)*a*b*c^5 - 5*sqrt
(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b
^2*c^5 - 2*(b^2 - 4*a*c)*b^2*c^5 + 10*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2
 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*c^6 + 4*(b^2 - 4*a*c)*a*c^6)*abs
(a - b + c))*(pi*floor(1/2*x/pi + 1/2) + arctan(2*sqrt(1/2)*tan(1/2*x)/sqrt
((2*a*c - 2*c^2 + sqrt(-4*(a*c + b*c + c^2)*(a*c - b*c + c^2) + 4*(a*c - c^
2)^2))/(a*c - b*c + c^2))))/((3*a^6*b^2*c^2 - 8*a^5*b^3*c^2 - a^4*b^4*c^2 +
 16*a^3*b^5*c^2 - 7*a^2*b^6*c^2 - 8*a*b^7*c^2 + 5*b^8*c^2 - 12*a^7*c^3 + 32
*a^6*b*c^3 + 30*a^5*b^2*c^3 - 112*a^4*b^3*c^3 + 8*a^3*b^4*c^3 + 96*a^2*b^5*
```

c^3 - 26*a*b^6*c^3 - 16*b^7*c^3 - 104*a^6*c^4 + 192*a^5*b*c^4 + 149*a^4*b^2
*c^4 - 336*a^3*b^3*c^4 - 30*a^2*b^4*c^4 + 112*a*b^5*c^4 + 17*b^6*c^4 - 276*
a^5*c^5 + 320*a^4*b*c^5 + 292*a^3*b^2*c^5 - 224*a^2*b^3*c^5 - 120*a*b^4*c^5
 - 304*a^4*c^6 + 128*a^3*b*c^6 + 237*a^2*b^2*c^6 + 24*a*b^3*c^6 - 17*b^4*c^
6 - 116*a^3*c^7 - 96*a^2*b*c^7 + 62*a*b^2*c^7 + 16*b^3*c^7 + 24*a^2*c^8 - 6
4*a*b*c^8 - 5*b^2*c^8 + 20*a*c^9)*abs(c)) - ((2*a^3*b^4 - 6*a^2*b^5 + 6*a*b
^6 - 2*b^7 - 16*a^4*b^2*c + 48*a^3*b^3*c - 44*a^2*b^4*c + 8*a*b^5*c + 4*b^6
*c + 32*a^5*c^2 - 96*a^4*b*c^2 + 64*a^3*b^2*c^2 + 32*a^2*b^3*c^2 - 30*a*b^4
*c^2 - 2*b^5*c^2 + 64*a^4*c^3 - 128*a^3*b*c^3 + 48*a^2*b^2*c^3 + 16*a*b^3*c
^3 + 32*a^3*c^4 - 32*a^2*b*c^4 + 3*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 -
4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*b^2 - 2*(b^2 - 4*a*c)*a^3*b^2 - 5
*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a
*c)*a^2*b^3 + 6*(b^2 - 4*a*c)*a^2*b^3 - 3*sqrt(a^2 - a*b + b*c - c^2 + sqrt
(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^4 - 6*(b^2 - 4*a*c)*a*b^4
+ 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 -
4*a*c)*b^5 + 2*(b^2 - 4*a*c)*b^5 - 12*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2
 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^4*c + 8*(b^2 - 4*a*c)*a^4*c + 20
*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a
*c)*a^3*b*c - 24*(b^2 - 4*a*c)*a^3*b*c + 26*sqrt(a^2 - a*b + b*c - c^2 + sq
rt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b^2*c + 20*(b^2 - 4*a*c)
*a^2*b^2*c - 28*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))
*sqrt(b^2 - 4*a*c)*a*b^3*c - 6*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*
c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^4*c - 4*(b^2 - 4*a*c)*b^4*c - 56*sqrt(a
^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3
c^2 + 16(b^2 - 4*a*c)*a^3*c^2 + 32*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2
- 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b*c^2 - 32*(b^2 - 4*a*c)*a^2*b*
c^2 + 19*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b
^2 - 4*a*c)*a*b^2*c^2 + 14*(b^2 - 4*a*c)*a*b^2*c^2 + 5*sqrt(a^2 - a*b + b*c
 - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^3*c^2 + 2*(b^2
- 4*a*c)*b^3*c^2 + 20*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b
 + c))*sqrt(b^2 - 4*a*c)*a^2*c^3 + 8*(b^2 - 4*a*c)*a^2*c^3 - 20*sqrt(a^2 -
a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b*c^3
- 8*(b^2 - 4*a*c)*a*b*c^3)*c^2*abs(a - b + c) + (4*a^3*b^4*c - 4*a^2*b^5*c
- 4*a*b^6*c + 4*b^7*c - 32*a^4*b^2*c^2 + 32*a^3*b^3*c^2 + 40*a^2*b^4*c^2 -
32*a*b^5*c^2 - 8*b^6*c^2 + 64*a^5*c^3 - 64*a^4*b*c^3 - 128*a^3*b^2*c^3 + 64
*a^2*b^3*c^3 + 68*a*b^4*c^3 + 4*b^5*c^3 + 128*a^4*c^4 - 160*a^2*b^2*c^4 - 3
2*a*b^3*c^4 + 64*a^3*c^5 + 64*a^2*b*c^5 + 3*sqrt(a^2 - a*b + b*c - c^2 + sq
rt(b^2 - 4*a*c)*(a - b + c))*a^4*b^2*c - 2*sqrt(a^2 - a*b + b*c - c^2 + sqr
t(b^2 - 4*a*c)*(a - b + c))*a^3*b^3*c - 8*sqrt(a^2 - a*b + b*c - c^2 + sqrt
(b^2 - 4*a*c)*(a - b + c))*a^2*b^4*c + 2*sqrt(a^2 - a*b + b*c - c^2 + sqrt(
b^2 - 4*a*c)*(a - b + c))*a*b^5*c + 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2
 - 4*a*c)*(a - b + c))*b^6*c - 12*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4
*a*c)*(a - b + c))*a^5*c^2 + 8*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*
c)*(a - b + c))*a^4*b*c^2 + 49*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*
c)*(a - b + c))*a^3*b^2*c^2 - sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c

```
)*(a - b + c))*a^2*b^3*c^2 - 41*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a
*c)*(a - b + c))*a*b^4*c^2 - 11*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a
*c)*(a - b + c))*b^5*c^2 - 68*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c
)*(a - b + c))*a^4*c^3 - 28*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*
(a - b + c))*a^3*b*c^3 + 93*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*
(a - b + c))*a^2*b^2*c^3 + 64*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c
)*(a - b + c))*a*b^3*c^3 + 11*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c
)*(a - b + c))*b^4*c^3 - 36*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*
(a - b + c))*a^3*c^4 - 80*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a
 - b + c))*a^2*b*c^4 - 49*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a
 - b + c))*a*b^2*c^4 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a
- b + c))*b^3*c^4 + 20*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a -
b + c))*a^2*c^5 + 20*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b
+ c))*a*b*c^5 - 4*(b^2 - 4*a*c)*a^3*b^2*c + 4*(b^2 - 4*a*c)*a^2*b^3*c + 4*(
b^2 - 4*a*c)*a*b^4*c - 4*(b^2 - 4*a*c)*b^5*c + 16*(b^2 - 4*a*c)*a^4*c^2 - 1
6*(b^2 - 4*a*c)*a^3*b*c^2 - 24*(b^2 - 4*a*c)*a^2*b^2*c^2 + 16*(b^2 - 4*a*c)
*a*b^3*c^2 + 8*(b^2 - 4*a*c)*b^4*c^2 + 32*(b^2 - 4*a*c)*a^3*c^3 - 36*(b^2 -
 4*a*c)*a*b^2*c^3 - 4*(b^2 - 4*a*c)*b^3*c^3 + 16*(b^2 - 4*a*c)*a^2*c^4 + 16
*(b^2 - 4*a*c)*a*b*c^4)*abs(a - b + c)*abs(c) + (2*a^4*b^3*c^2 - 6*a^3*b^4*
c^2 + 6*a^2*b^5*c^2 - 2*a*b^6*c^2 - 8*a^5*b*c^3 + 28*a^4*b^2*c^3 - 30*a^3*b
^3*c^3 + 10*a^2*b^4*c^3 - 2*a*b^5*c^3 + 2*b^6*c^3 - 16*a^5*c^4 + 24*a^4*b*c
^4 - 4*a^3*b^2*c^4 + 6*a^2*b^3*c^4 - 6*a*b^4*c^4 - 4*b^5*c^4 - 16*a^4*c^5 +
 8*a^3*b*c^5 - 12*a^2*b^2*c^5 + 22*a*b^3*c^5 + 2*b^4*c^5 + 16*a^3*c^6 - 24*
a^2*b*c^6 - 12*a*b^2*c^6 + 16*a^2*c^7 + 3*sqrt(a^2 - a*b + b*c - c^2 + sqrt
(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^4*b*c^2 - 2*(b^2 - 4*a*c)*a^
4*b*c^2 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqr
t(b^2 - 4*a*c)*a^3*b^2*c^2 + 6*(b^2 - 4*a*c)*a^3*b^2*c^2 - 3*sqrt(a^2 - a*b
 + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b^3*c^2
 - 6*(b^2 - 4*a*c)*a^2*b^3*c^2 + 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 -
4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^4*c^2 + 2*(b^2 - 4*a*c)*a*b^4*c^2
 + 6*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 -
 4*a*c)*a^4*c^3 - 4*(b^2 - 4*a*c)*a^4*c^3 + 7*sqrt(a^2 - a*b + b*c - c^2 +
sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^3*b*c^3 + 6*(b^2 - 4*a*c
)*a^3*b*c^3 - 13*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c)
)*sqrt(b^2 - 4*a*c)*a^2*b^2*c^3 - 2*(b^2 - 4*a*c)*a^2*b^2*c^3 - 3*sqrt(a^2
- a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^3*
c^3 + 2*(b^2 - 4*a*c)*a*b^3*c^3 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 -
 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^4*c^3 - 2*(b^2 - 4*a*c)*b^4*c^3 +
22*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4
*a*c)*a^3*c^4 - 4*(b^2 - 4*a*c)*a^3*c^4 - 3*sqrt(a^2 - a*b + b*c - c^2 + sq
rt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b*c^4 + 2*(b^2 - 4*a*c)*
a^2*b*c^4 + 23*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*
sqrt(b^2 - 4*a*c)*a*b^2*c^4 - 2*(b^2 - 4*a*c)*a*b^2*c^4 + 6*sqrt(a^2 - a*b
+ b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^3*c^4 + 4*
(b^2 - 4*a*c)*b^3*c^4 - 38*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(
```

```
a - b + c))*sqrt(b^2 - 4*a*c)*a^2*c^5 + 4*(b^2 - 4*a*c)*a^2*c^5 - 7*sqrt(a^
2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b*
c^5 - 6*(b^2 - 4*a*c)*a*b*c^5 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4
*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^2*c^5 - 2*(b^2 - 4*a*c)*b^2*c^5 + 10
*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a
*c)*a*c^6 + 4*(b^2 - 4*a*c)*a*c^6)*abs(a - b + c))*(pi*floor(1/2*x/pi + 1/2
) + arctan(2*sqrt(1/2)*tan(1/2*x)/sqrt((2*a*c - 2*c^2 - sqrt(-4*(a*c + b*c
+ c^2)*(a*c - b*c + c^2) + 4*(a*c - c^2)^2))/(a*c - b*c + c^2))))/((3*a^6*b
^2*c^2 - 8*a^5*b^3*c^2 - a^4*b^4*c^2 + 16*a^3*b^5*c^2 - 7*a^2*b^6*c^2 - 8*a
*b^7*c^2 + 5*b^8*c^2 - 12*a^7*c^3 + 32*a^6*b*c^3 + 30*a^5*b^2*c^3 - 112*a^4
*b^3*c^3 + 8*a^3*b^4*c^3 + 96*a^2*b^5*c^3 - 26*a*b^6*c^3 - 16*b^7*c^3 - 104
*a^6*c^4 + 192*a^5*b*c^4 + 149*a^4*b^2*c^4 - 336*a^3*b^3*c^4 - 30*a^2*b^4*c
^4 + 112*a*b^5*c^4 + 17*b^6*c^4 - 276*a^5*c^5 + 320*a^4*b*c^5 + 292*a^3*b^2
*c^5 - 224*a^2*b^3*c^5 - 120*a*b^4*c^5 - 304*a^4*c^6 + 128*a^3*b*c^6 + 237*
a^2*b^2*c^6 + 24*a*b^3*c^6 - 17*b^4*c^6 - 116*a^3*c^7 - 96*a^2*b*c^7 + 62*a
*b^2*c^7 + 16*b^3*c^7 + 24*a^2*c^8 - 64*a*b*c^8 - 5*b^2*c^8 + 20*a*c^9)*abs
(c))
```

maple [B] time = 0.10, size = 1948, normalized size = 7.64

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(x)^2/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 2/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b+2/c/(a-b+c)/(((-4*a*c+b
^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2
)+a-c)*(a-b+c))^(1/2))*a*b-1/c*b/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^
(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-
a+c)*(a-b+c))^(1/2))*a^2+1/c*b/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1
/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)
*(a-b+c))^(1/2))*a^2+1/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)
*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+
c))^(1/2))*b^2+1/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-
b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1
/2))*b^3+1/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c
)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b+1/(a-b+c)/(((-4*a*
c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(
1/2)+a-c)*(a-b+c))^(1/2))*b-1/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1
/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a
-1/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*
x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a-1/(-4*a*c+b^2)^(1/2)/(a-b+c)
/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a
*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2-1/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c
```

```
)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c
))^(1/2))*b^2+2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c
))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)
)*a^2-1/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2-2/(-4*a*c+b^2)^(1
/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2-1/c/(a-b+c)/(((-4*a*c+b
^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1
/2)-a+c)*(a-b+c))^(1/2))*b^2-2/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^
(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-
c)*(a-b+c))^(1/2))*a*b^2-1/c/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/
2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a^2+
2/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arc
tanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b^2+2/
c*arctan(tan(1/2*x))+1/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)
*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+
c))^(1/2))*a*b-1/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+
c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2
))*a*b-1/c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1
/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b
^3-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*ar
ctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*a+2/(
-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((
a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c*a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2c\int\frac{2b^2\cos(3x)^2+2b^2\cos(x)^2+2b^2\sin(3x)^2+2b^2\sin(x)^2+4\left(2a^2+ac\right)\cos(2x)^2+bc\cos(x)+4}{c^3\cos(4x)^2+4b^2c\cos(3x)^2+4b^2c\cos(x)^2+c^3\sin(4x)^2+4b^2c\sin(3x)^2+4b^2c\sin(x)^2+4bc^2\cos(x)+c^3+4\left(4a^2c+4ac^2+c^3\right)\cos(2x)^2+4\left(4a^2c+\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] -(c*integrate(2*(2*b^2*cos(3*x)^2 + 2*b^2*cos(x)^2 + 2*b^2*sin(3*x)^2 + 2*b
^2*sin(x)^2 + 4*(2*a^2 + a*c)*cos(2*x)^2 + b*c*cos(x) + 4*(2*a^2 + a*c)*sin
(2*x)^2 + 2*(4*a*b + b*c)*sin(2*x)*sin(x) + (b*c*cos(3*x) + 2*a*c*cos(2*x)
+ b*c*cos(x))*cos(4*x) + (4*b^2*cos(x) + b*c + 2*(4*a*b + b*c)*cos(2*x))*co
s(3*x) + 2*(a*c + (4*a*b + b*c)*cos(x))*cos(2*x) + (b*c*sin(3*x) + 2*a*c*si
n(2*x) + b*c*sin(x))*sin(4*x) + 2*(2*b^2*sin(x) + (4*a*b + b*c)*sin(2*x))*s
in(3*x))/(c^3*cos(4*x)^2 + 4*b^2*c*cos(3*x)^2 + 4*b^2*c*cos(x)^2 + c^3*sin(
4*x)^2 + 4*b^2*c*sin(3*x)^2 + 4*b^2*c*sin(x)^2 + 4*b*c^2*cos(x) + c^3 + 4*(
4*a^2*c + 4*a*c^2 + c^3)*cos(2*x)^2 + 4*(4*a^2*c + 4*a*c^2 + c^3)*sin(2*x)^
2 + 8*(2*a*b*c + b*c^2)*sin(2*x)*sin(x) + 2*(2*b*c^2*cos(3*x) + 2*b*c^2*cos
(x) + c^3 + 2*(2*a*c^2 + c^3)*cos(2*x))*cos(4*x) + 4*(2*b^2*c*cos(x) + b*c^
```

```
2 + 2*(2*a*b*c + b*c^2)*cos(2*x))*cos(3*x) + 4*(2*a*c^2 + c^3 + 2*(2*a*b*c
+ b*c^2)*cos(x))*cos(2*x) + 4*(b*c^2*sin(3*x) + b*c^2*sin(x) + (2*a*c^2 + c
^3)*sin(2*x))*sin(4*x) + 8*(b^2*c*sin(x) + (2*a*b*c + b*c^2)*sin(2*x))*sin(
3*x)), x) - x)/c
```

mupad [B] time = 14.56, size = 20133, normalized size = 78.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(x)^2/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] (2*atan((540672*a^4*tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c +
 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c
- (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 +
(229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*
b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (16384*
b^4*tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16
384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c
+ (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)
/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (3276
8*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (147456*a^5*tan(x/2))/(
49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 1638
4*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 -
 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c +
 (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c
 - 393216*a^3*b*c) - (16384*b^5*tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540
672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*
a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b
*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*
b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) - (360448*a^2
*b^2*tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 1
6384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c
 + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3
)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (327
68*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (262144*a^2*c^2*tan(x/
2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 -
360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a
*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (2621
44*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)
/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (49152*a*b^4*tan(x/2))/(49152*a*b
^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 2
29376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a
*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a
^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216
```

*a^3*b*c) - (147456*a^4*b*tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) - (32768*a*b^5*tan(x/2))/(147456*a^5*c - 32768*a*b^5 - 16384*b^5*c + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 + 262144*a^2*c^4 + 655360*a^3*c^3 + 540672*a^4*c^2 + 16384*b^4*c^2 - 131072*a*b^2*c^3 + 131072*a*b^3*c^2 - 262144*a^2*b*c^3 + 229376*a^2*b^3*c - 393216*a^3*b*c^2 - 262144*a^3*b^2*c - 360448*a^2*b^2*c^2 + 49152*a*b^4*c - 147456*a^4*b*c) + (229376*a^2*b^3*tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) - (262144*a^3*b^2*tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) + (131072*a*b^3*tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) - (393216*a^3*b*tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (655360*a^3*c*tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (32768*a^2*b^4*tan(x/2))/(147456*a^5*c - 32768*a*b^5 - 16384*b^5*c + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 + 262144*a^2*c^4 + 655360*a^3*c^3 + 540672*a^4*c^2 + 16384*b^4*c^2 - 131072*a*b^2*c^3 + 131072*a*b^3*c^2 - 262144*a^2*b*c^3 + 229376*a^2*b^3*c - 393216*a^3*b*c^2 - 262144*a^3*b^2*c - 360448*a^2*b^2*c^2 + 49152*a*b^4*c - 147456*a^4*b*c) + (32768*a^3*b^3*tan(x/2))/(147456*a^5*c - 32768*a*b^5 - 16384*b^5*c + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 + 262144*a^2*c^4 + 655360*a^3*c^3 + 540672*a^4*c^2 + 16384*b^4*c^2 - 131072*a*b^2*c^3 + 131072*a*b^3*c^2 - 262144*a^2*b*c^3 + 229376*a^2*b^3*c - 393216*a^3*b*c^2 - 262144*a^3*b^2*c - 360448*a^2*b^2*c^2 + 49152*a*b^4*c - 147456*a^4*b*c) - (32768*a^4*b^2*tan(x/2))/(147456*a^5*c - 32768*a*b^5 - 16384*b^5*c + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 + 262144*a^2*c^4 + 655360*a^3*c^3 + 540672*a^4*c^2 + 16384*b^4*

c^2 - 131072*a*b^2*c^3 + 131072*a*b^3*c^2 - 262144*a^2*b*c^3 + 229376*a^2*b
^3*c - 393216*a^3*b*c^2 - 262144*a^3*b^2*c - 360448*a^2*b^2*c^2 + 49152*a*b
^4*c - 147456*a^4*b*c) - (131072*a*b^2*c*tan(x/2))/(131072*a*b^3 - 393216*a
^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*
c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c -
(32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b
^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 2621
44*a^2*b*c) - (262144*a^2*b*c*tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 6553
60*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (1474
56*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b
^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (
32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c)
))/c + atan(-(((-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^
2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2
+ 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^
5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^
2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*((tan(x/2)*(16384*a*b^6 - 6553
6*a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 245760*
a^2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b^2*c^5
- 49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 + 475136
*a*b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c - 10813
44*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 557056
*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b*c^5 + 9
8304*a*b^5*c) - (-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b
^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^
2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c
^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b
^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(8192*b^3*c^5 - 557056*a^3*c^
5 - 425984*a^4*c^4 - 98304*a^5*c^3 - 229376*a^2*c^6 - 40960*b^4*c^4 + 57344
*b^5*c^3 - 24576*b^6*c^2 + 221184*a*b^2*c^5 - 327680*a*b^3*c^4 + 90112*a*b^
4*c^3 + 49152*a*b^5*c^2 + 393216*a^2*b*c^5 + 622592*a^3*b*c^4 + 196608*a^4*
b*c^3 + tan(x/2)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c -
b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c
^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*
c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*
b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072*a^2*c^
7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 4915
2*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2 +
294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^3
- 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4 -
655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*b^
5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - 114688
*a^4*b^2*c^3 - 196608*a*b*c^7) + 172032*a^2*b^2*c^4 - 352256*a^2*b^3*c^3 +
106496*a^3*b^2*c^3 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 - 32768*a*b*c^6)
)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) +

a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c
+ 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^
4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b
^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 32768*a*b^5 + 24576*a^5*c - 49152*b^5*c +
24576*b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 +
253952*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^2 - 155648*a*
b^2*c^3 + 262144*a*b^3*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a
^3*b*c^2 + 24576*a^3*b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b
^4*c - 122880*a^4*b*c) - tan(x/2)*(40960*a*b^4 - 57344*a^4*b - 73728*a^4*c
+ 8192*b^4*c + 24576*a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^3*b^2 + 16384
*a^2*c^3 - 81920*a^3*c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 - 81920*a^2*b^
2*c + 163840*a^3*b*c))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*
a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2
*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 3
2*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 3
2*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*1i - ((-(a^2*b^4 - b^6
+ 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c -
b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c
- b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*
c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2
c^3)))^(1/2)(24576*a^5*c - 32768*a*b^5 - (tan(x/2)*(16384*a*b^6 - 65536*a
*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 245760*a^2
*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b^2*c^5 - 4
9152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 + 475136*a*
b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c - 1081344*
a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 557056*a^
2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b*c^5 + 9830
4*a*b^5*c) - (-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)
^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 +
8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5
+ 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*
c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(229376*a^2*c^6 + 557056*a^3*c^5
+ 425984*a^4*c^4 + 98304*a^5*c^3 - 8192*b^3*c^5 + 40960*b^4*c^4 - 57344*b^
5*c^3 + 24576*b^6*c^2 - 221184*a*b^2*c^5 + 327680*a*b^3*c^4 - 90112*a*b^4*c
^3 - 49152*a*b^5*c^2 - 393216*a^2*b*c^5 - 622592*a^3*b*c^4 - 196608*a^4*b*c
^3 + tan(x/2)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2
)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2
+ 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5
+ 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2
*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072*a^2*c^7 -
262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 49152*b
^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2 + 29
4912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^3 - 1
6384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4 - 65
5360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*b^5*c

^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - 114688*a^
4*b^2*c^3 - 196608*a*b*c^7) - 172032*a^2*b^2*c^4 + 352256*a^2*b^3*c^3 - 106
496*a^3*b^2*c^3 + 49152*a^3*b^3*c^2 - 24576*a^4*b^2*c^2 + 32768*a*b*c^6))*(
-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^
2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2
*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 +
 b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*
c^2 - 8*a^3*b^2*c^3)))^(1/2) - 49152*b^5*c + 24576*b^6 - 16384*a^2*b^4 + 32
768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 + 253952*a^3*c^3 + 180224*a^4*c^
2 - 8192*b^3*c^3 + 32768*b^4*c^2 - 155648*a*b^2*c^3 + 262144*a*b^3*c^2 - 27
0336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a^3*b*c^2 + 24576*a^3*b^2*c + 16
384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b^4*c - 122880*a^4*b*c) + tan(x/
2)*(40960*a*b^4 - 57344*a^4*b - 73728*a^4*c + 8192*b^4*c + 24576*a^5 - 8192
*b^5 - 81920*a^2*b^3 + 81920*a^3*b^2 + 16384*a^2*c^3 - 81920*a^3*c^2 - 3276
8*a*b^2*c^2 + 81920*a^2*b*c^2 - 81920*a^2*b^2*c + 163840*a^3*b*c))*(-(a^2*b
^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(
4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*
(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^
4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8
*a^3*b^2*c^3)))^(1/2)*1i)/(((-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*
(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 1
8*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^
6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^
3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*((tan(x/2)*(16384
*a*b^6 - 65536*a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*
b^4 + 245760*a^2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 1
6384*b^2*c^5 - 49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2
*c^4 + 475136*a*b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*
b^4*c - 1081344*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b
^2*c + 557056*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 19660
8*a*b*c^5 + 98304*a*b^5*c) - (-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3
*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c -
18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c
^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c
^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(8192*b^3*c^5 -
557056*a^3*c^5 - 425984*a^4*c^4 - 98304*a^5*c^3 - 229376*a^2*c^6 - 40960*b^
4*c^4 + 57344*b^5*c^3 - 24576*b^6*c^2 + 221184*a*b^2*c^5 - 327680*a*b^3*c^4
 + 90112*a*b^4*c^3 + 49152*a*b^5*c^2 + 393216*a^2*b*c^5 + 622592*a^3*b*c^4
+ 196608*a^4*b*c^3 + tan(x/2)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^
3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c -
 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*
c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*
c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(65536*a*c^8 -
131072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b
^2*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16

384*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 1146
88*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 6553
6*a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 -
16384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4
*c^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7) + 172032*a^2*b^2*c^4 - 352256*a
^2*b^3*c^3 + 106496*a^3*b^2*c^3 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 - 3
2768*a*b*c^6))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^
2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2
+ 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^
5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^
2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 32768*a*b^5 + 24576*a^5*c -
49152*b^5*c + 24576*b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98
304*a^2*c^4 + 253952*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^
2 - 155648*a*b^2*c^3 + 262144*a*b^3*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3
*c - 458752*a^3*b*c^2 + 24576*a^3*b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4
- 114688*a*b^4*c - 122880*a^4*b*c) - tan(x/2)*(40960*a*b^4 - 57344*a^4*b -
73728*a^4*c + 8192*b^4*c + 24576*a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^
3*b^2 + 16384*a^2*c^3 - 81920*a^3*c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 -
81920*a^2*b^2*c + 163840*a^3*b*c))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^
2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b
^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(1
6*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*
a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) + ((-(a^2
*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(
-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*
c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*
c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 -
8*a^3*b^2*c^3)))^(1/2)*(24576*a^5*c - 32768*a*b^5 - (tan(x/2)*(16384*a*b^6
- 65536*a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 +
245760*a^2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b
^2*c^5 - 49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 +
475136*a*b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c
- 1081344*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c +
557056*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b*
c^5 + 98304*a*b^5*c) - (-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*
a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2
*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 3
2*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 3
2*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(229376*a^2*c^6 + 5570
56*a^3*c^5 + 425984*a^4*c^4 + 98304*a^5*c^3 - 8192*b^3*c^5 + 40960*b^4*c^4
- 57344*b^5*c^3 + 24576*b^6*c^2 - 221184*a*b^2*c^5 + 327680*a*b^3*c^4 - 901
12*a*b^4*c^3 - 49152*a*b^5*c^2 - 393216*a^2*b*c^5 - 622592*a^3*b*c^4 - 1966
08*a^4*b*c^3 + tan(x/2)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4
*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^
2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 +

32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 -
32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072
*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7
+ 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^
7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b
^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*
b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384
*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 -
114688*a^4*b^2*c^3 - 196608*a*b*c^7) - 172032*a^2*b^2*c^4 + 352256*a^2*b^3
*c^3 - 106496*a^3*b^2*c^3 + 49152*a^3*b^3*c^2 - 24576*a^4*b^2*c^2 + 32768*a
*b*c^6))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^
(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a
*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16
*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4
+ a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 49152*b^5*c + 24576*b^6 - 16384*a^
2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 + 253952*a^3*c^3 + 180
224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^2 - 155648*a*b^2*c^3 + 262144*a*b^
3*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a^3*b*c^2 + 24576*a^3*
b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b^4*c - 122880*a^4*b*c
) + tan(x/2)*(40960*a*b^4 - 57344*a^4*b - 73728*a^4*c + 8192*b^4*c + 24576*
a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^3*b^2 + 16384*a^2*c^3 - 81920*a^3*
c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 - 81920*a^2*b^2*c + 163840*a^3*b*c)
)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) +
a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c
+ 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^
4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b
^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 65536*a^3*b + 49152*a^3*c + 49152*a^4 + 1
6384*a^2*b^2 - 16384*a^2*b*c))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b
^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c
- 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2
*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4
*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*2i + atan(((ta
n(x/2)*(40960*a*b^4 - 57344*a^4*b - 73728*a^4*c + 8192*b^4*c + 24576*a^5 -
8192*b^5 - 81920*a^2*b^3 + 81920*a^3*b^2 + 16384*a^2*c^3 - 81920*a^3*c^2 -
32768*a*b^2*c^2 + 81920*a^2*b*c^2 - 81920*a^2*b^2*c + 163840*a^3*b*c) + ((b
^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b
*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*
b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^
4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2
- 8*a^3*b^2*c^3)))^(1/2)*(24576*a^5*c - 32768*a*b^5 - 49152*b^5*c + 24576*
b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 + 253952
*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^2 + (((b^6 - a^2*b^4
- 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c -
b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c
- b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*

c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2
c^3)))^(1/2)(229376*a^2*c^6 + 557056*a^3*c^5 + 425984*a^4*c^4 + 98304*a^5
*c^3 - 8192*b^3*c^5 + 40960*b^4*c^4 - 57344*b^5*c^3 + 24576*b^6*c^2 - 22118
4*a*b^2*c^5 + 327680*a*b^3*c^4 - 90112*a*b^4*c^3 - 49152*a*b^5*c^2 - 393216
*a^2*b*c^5 - 622592*a^3*b*c^4 - 196608*a^4*b*c^3 - 172032*a^2*b^2*c^4 + 352
256*a^2*b^3*c^3 - 106496*a^3*b^2*c^3 + 49152*a^3*b^3*c^2 - 24576*a^4*b^2*c^
2 + 32768*a*b*c^6 + tan(x/2)*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*
(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 1
8*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^
6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^
3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(65536*a*c^8 - 13
1072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2
*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 1638
4*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688
*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*
a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 1
6384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c
^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7)) - tan(x/2)*(16384*a*b^6 - 65536*
a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 245760*a^
2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b^2*c^5 -
49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 + 475136*a
*b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c - 1081344
*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 557056*a
^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b*c^5 + 983
04*a*b^5*c))*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^
3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 -
8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 +
16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c
^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 155648*a*b^2*c^3 + 262144*a*b^3
*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a^3*b*c^2 + 24576*a^3*b
^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b^4*c - 122880*a^4*b*c)
)*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) +
a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c +
2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4
+ b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^
4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*1i + (tan(x/2)*(40960*a*b^4 - 57344*a^4*b -
73728*a^4*c + 8192*b^4*c + 24576*a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^3
*b^2 + 16384*a^2*c^3 - 81920*a^3*c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 -
81920*a^2*b^2*c + 163840*a^3*b*c) - ((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2
- b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^
2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16
*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a
*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(24576*a^5
*c - 32768*a*b^5 - 49152*b^5*c + 24576*b^6 - 16384*a^2*b^4 + 32768*a^3*b^3
- 8192*a^4*b^2 + 98304*a^2*c^4 + 253952*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3

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*c^3 + 32768*b^4*c^2 - (((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*
a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2
*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 3
2*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 3
2*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(8192*b^3*c^5 - 557056
*a^3*c^5 - 425984*a^4*c^4 - 98304*a^5*c^3 - 229376*a^2*c^6 - 40960*b^4*c^4
+ 57344*b^5*c^3 - 24576*b^6*c^2 + 221184*a*b^2*c^5 - 327680*a*b^3*c^4 + 901
12*a*b^4*c^3 + 49152*a*b^5*c^2 + 393216*a^2*b*c^5 + 622592*a^3*b*c^4 + 1966
08*a^4*b*c^3 + 172032*a^2*b^2*c^4 - 352256*a^2*b^3*c^3 + 106496*a^3*b^2*c^3
 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 - 32768*a*b*c^6 + tan(x/2)*((b^6 -
 a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(
4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*
(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^
4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8
*a^3*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072*a^2*c^7 - 262144*a^3*c^6 + 1310
72*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5
 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2 + 294912*a*b^2*c^6 - 40960
0*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^3 - 16384*a*b^6*c^2 + 58982
4*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4 - 655360*a^2*b^2*c^5 + 163
84*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 557056*a^3*b^2*c^
4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - 114688*a^4*b^2*c^3 - 196608*a*b
*c^7)) - tan(x/2)*(16384*a*b^6 - 65536*a*c^6 + 49152*b^6*c - 16384*b^7 + 16
384*a^2*b^5 - 16384*a^3*b^4 + 245760*a^2*c^5 + 671744*a^3*c^4 + 212992*a^4*
c^3 - 147456*a^5*c^2 + 16384*b^2*c^5 - 49152*b^3*c^4 + 65536*b^4*c^3 - 6553
6*b^5*c^2 - 327680*a*b^2*c^4 + 475136*a*b^3*c^3 - 393216*a*b^4*c^2 - 802816
*a^2*b*c^4 - 180224*a^2*b^4*c - 1081344*a^3*b*c^3 - 65536*a^3*b^3*c + 49152
*a^4*b*c^2 + 98304*a^4*b^2*c + 557056*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 34
4064*a^3*b^2*c^2 + 196608*a*b*c^5 + 98304*a*b^5*c))*((b^6 - a^2*b^4 - 8*a^3
*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^
(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^
3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*
a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^
(1/2) - 155648*a*b^2*c^3 + 262144*a*b^3*c^2 - 270336*a^2*b*c^3 + 237568*a^2
*b^3*c - 458752*a^3*b*c^2 + 24576*a^3*b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b
*c^4 - 114688*a*b^4*c - 122880*a^4*b*c))*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^
4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a
^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(
2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 +
 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*1i)/(
(tan(x/2)*(40960*a*b^4 - 57344*a^4*b - 73728*a^4*c + 8192*b^4*c + 24576*a^5
 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^3*b^2 + 16384*a^2*c^3 - 81920*a^3*c^2
 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 - 81920*a^2*b^2*c + 163840*a^3*b*c) +
((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^
2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2
*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 +
```

b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*
c^2 - 8*a^3*b^2*c^3)))^(1/2)*(24576*a^5*c - 32768*a*b^5 - 49152*b^5*c + 245
76*b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 + 253
952*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^2 + (((b^6 - a^2*
b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c
 - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*
a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b
^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*
b^2*c^3)))^(1/2)*(229376*a^2*c^6 + 557056*a^3*c^5 + 425984*a^4*c^4 + 98304*
a^5*c^3 - 8192*b^3*c^5 + 40960*b^4*c^4 - 57344*b^5*c^3 + 24576*b^6*c^2 - 22
1184*a*b^2*c^5 + 327680*a*b^3*c^4 - 90112*a*b^4*c^3 - 49152*a*b^5*c^2 - 393
216*a^2*b*c^5 - 622592*a^3*b*c^4 - 196608*a^4*b*c^3 - 172032*a^2*b^2*c^4 +
352256*a^2*b^3*c^3 - 106496*a^3*b^2*c^3 + 49152*a^3*b^3*c^2 - 24576*a^4*b^2
*c^2 + 32768*a*b*c^6 + tan(x/2)*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b
^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c
+ 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2
*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4
*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(65536*a*c^8 -
 131072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*
b^2*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 1
6384*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114
688*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 655
36*a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3
- 16384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^
4*c^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7)) - tan(x/2)*(16384*a*b^6 - 655
36*a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 245760
*a^2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b^2*c^5
 - 49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 + 47513
6*a*b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c - 1081
344*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 55705
6*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b*c^5 +
98304*a*b^5*c))*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^
2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2
 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^
5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^
2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 155648*a*b^2*c^3 + 262144*a*
b^3*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a^3*b*c^2 + 24576*a^
3*b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b^4*c - 122880*a^4*b
c))((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2)
 + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*
c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*
c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2
*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - (tan(x/2)*(40960*a*b^4 - 57344*a^4*b -
73728*a^4*c + 8192*b^4*c + 24576*a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^3
*b^2 + 16384*a^2*c^3 - 81920*a^3*c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 -

81920*a^2*b^2*c + 163840*a^3*b*c) - ((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(24576*a^5*c - 32768*a*b^5 - 49152*b^5*c + 24576*b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 + 253952*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^2 - (((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(8192*b^3*c^5 - 557056*a^3*c^5 - 425984*a^4*c^4 - 98304*a^5*c^3 - 229376*a^2*c^6 - 40960*b^4*c^4 + 57344*b^5*c^3 - 24576*b^6*c^2 + 221184*a*b^2*c^5 - 327680*a*b^3*c^4 + 90112*a*b^4*c^3 + 49152*a*b^5*c^2 + 393216*a^2*b*c^5 + 622592*a^3*b*c^4 + 196608*a^4*b*c^3 + 172032*a^2*b^2*c^4 - 352256*a^2*b^3*c^3 + 106496*a^3*b^2*c^3 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 - 32768*a*b*c^6 + tan(x/2)*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(65536*a*c^8 - 131072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7)) - tan(x/2)*(16384*a*b^6 - 65536*a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 245760*a^2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b^2*c^5 - 49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 + 475136*a*b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c - 1081344*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 557056*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b*c^5 + 98304*a*b^5*c))*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 155648*a*b^2*c^3 + 262144*a*b^3*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a^3*b*c^2 + 24576*a^3*b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b^4*c - 122880*a^4*b*c))*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 +

```
 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 655
36*a^3*b + 49152*a^3*c + 49152*a^4 + 16384*a^2*b^2 - 16384*a^2*b*c))*((b^6
- a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^(1/2) + a^2*b*(-
(4*a*c - b^2)^3)^(1/2) + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c
*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c
^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 -
8*a^3*b^2*c^3)))^(1/2)*2i
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)**2/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Timed out
```

3.16 $\int \frac{\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=230

$$\frac{2\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}$$

```
[Out] 2*arctan((b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c-(-4*a*c+b^2)^(1
/2))^(1/2))*(1-b/(-4*a*c+b^2)^(1/2))/(b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*
c-(-4*a*c+b^2)^(1/2))^(1/2)+2*arctan((b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)*tan(1
/2*x)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2))*(1+b/(-4*a*c+b^2)^(1/2))/(b-2*c+(-4
*a*c+b^2)^(1/2))^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2)
```

Rubi [A] time = 0.55, antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {3257, 2659, 205}

$$\frac{2\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[x]/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (2*(1 - b/Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Tan[
x/2])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/(Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]
]*Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]) + (2*(1 + b/Sqrt[b^2 - 4*a*c])*ArcTan[
(Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2 - 4*a*
c]]])/(Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
```

```
&& NeQ[a^2 - b^2, 0]
```

Rule 3257

```
Int[cos[(d_.) + (e_.)*(x_)]^(m_.)*((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b
_.) + cos[(d_.) + (e_.)*(x_)]^(n2_.)*(c_.))^(p_), x_Symbol] :> Int[ExpandTr
ig[cos[d + e*x]^m*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n))^p, x], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && NeQ[b^2 - 4*a*c, 0] && Integ
ersQ[m, n, p]
```

Rubi steps

$$\int \frac{\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(\frac{1-\frac{b}{\sqrt{b^2-4ac}}}{b-\sqrt{b^2-4ac}+2c\cos(x)}+\frac{1+\frac{b}{\sqrt{b^2-4ac}}}{b+\sqrt{b^2-4ac}+2c\cos(x)}\right)dx$$

$$= \left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\int \frac{1}{b-\sqrt{b^2-4ac}+2c\cos(x)}\,dx+\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)\int \frac{}{b+\sqrt{b}}$$

$$= \left(2\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\right)\text{Subst}\left(\int \frac{1}{b+2c-\sqrt{b^2-4ac}+\left(b-2c-\sqrt{b^2-4ac}\right)x^2}\,d\right.$$

$$= \frac{2\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}}+\frac{2\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c+\sqrt{b^2}}}{\sqrt{b+2c+}}\right.}{\sqrt{b-2c+\sqrt{b^2-4ac}}\,\sqrt{b+2c+}}$$

Mathematica [A] time = 0.57, size = 227, normalized size = 0.99

$$\frac{\sqrt{2}\left(\frac{\left(\sqrt{b^2-4ac}-b\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}-b+2c\right)}{\sqrt{2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b\sqrt{b^2-4ac}+2c(a+c)-b^2}}-\frac{\left(\sqrt{b^2-4ac}+b\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}}\right)}{\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[x]/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (Sqrt[2]*(-(((b + Sqrt[b^2 - 4*a*c])*ArcTanh[((b - 2*c + Sqrt[b^2 - 4*a*c])
*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) - 2*b*Sqrt[b^2 - 4*a*c]]])/Sqrt[-b^2 +
```

```
 2*c*(a + c) - b*Sqrt[b^2 - 4*a*c]]) + ((-b + Sqrt[b^2 - 4*a*c])*ArcTanh[((
-b + 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) + 2*b*Sqr
t[b^2 - 4*a*c]]])/Sqrt[-b^2 + 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c]]))/Sqrt[b^2
 - 4*a*c]
```

fricas [B] time = 1.96, size = 3513, normalized size = 15.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] -1/4*sqrt(2)*sqrt(-(2*a^2 - b^2 + 2*a*c - (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2
 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 -
4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b
^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3
 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c))*log(a*b^2*cos(x) + 2*a*b*c +
 (a^3*b^2 - a*b^4 - 4*a^2*c^3 - (8*a^3 - a*b^2)*c^2 - 2*(2*a^4 - 3*a^2*b^2)
*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12
*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^
2 + 2*a*b^4)*c))*cos(x) + 1/2*sqrt(2)*((a^3*b^3 - a*b^5 + 4*a*b*c^4 + (4*a^
2*b - b^3)*c^3 - (4*a^3*b + 5*a*b^3)*c^2 - (4*a^4*b - 5*a^2*b^3 - b^5)*c)*s
qrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a
^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2
*a*b^4)*c))*sin(x) + (a*b^3 - 4*a*b*c^2 - (4*a^2*b - b^3)*c)*sin(x))*sqrt(-
(2*a^2 - b^2 + 2*a*c - (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*
a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 -
 b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(
a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^
2 - 2*(2*a^3 - 3*a*b^2)*c))) + 1/4*sqrt(2)*sqrt(-(2*a^2 - b^2 + 2*a*c - (a^
2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2
/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*
b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)
*c)))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)
)*log(a*b^2*cos(x) + 2*a*b*c + (a^3*b^2 - a*b^4 - 4*a^2*c^3 - (8*a^3 - a*b^
2)*c^2 - 2*(2*a^4 - 3*a^2*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a
*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2
+ b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*cos(x) - 1/2*sqrt(2)*((a^3*b
^3 - a*b^5 + 4*a*b*c^4 + (4*a^2*b - b^3)*c^3 - (4*a^3*b + 5*a*b^3)*c^2 - (4
*a^4*b - 5*a^2*b^3 - b^5)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5
- (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4
)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*sin(x) + (a*b^3 - 4*a*b*c^2 - (4*
a^2*b - b^3)*c)*sin(x))*sqrt(-(2*a^2 - b^2 + 2*a*c - (a^2*b^2 - b^4 - 4*a*c
^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b
^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4
```

```
 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^
4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c))) - 1/4*sqrt(2)*sq
rt(-(2*a^2 - b^2 + 2*a*c + (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2
*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a
^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 -
 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2
)*c^2 - 2*(2*a^3 - 3*a*b^2)*c))*log(-a*b^2*cos(x) - 2*a*b*c + (a^3*b^2 - a*
b^4 - 4*a^2*c^3 - (8*a^3 - a*b^2)*c^2 - 2*(2*a^4 - 3*a^2*b^2)*c)*sqrt(b^2/(
a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^
2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c
))*cos(x) + 1/2*sqrt(2)*((a^3*b^3 - a*b^5 + 4*a*b*c^4 + (4*a^2*b - b^3)*c^3
 - (4*a^3*b + 5*a*b^3)*c^2 - (4*a^4*b - 5*a^2*b^3 - b^5)*c)*sqrt(b^2/(a^4*b
^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^
3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*si
n(x) - (a*b^3 - 4*a*b*c^2 - (4*a^2*b - b^3)*c)*sin(x))*sqrt(-(2*a^2 - b^2 +
 2*a*c + (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)
*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12
*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^
2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 -
 3*a*b^2)*c))) + 1/4*sqrt(2)*sqrt(-(2*a^2 - b^2 + 2*a*c + (a^2*b^2 - b^4 -
4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*
a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(
8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2
 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c))*log(-a*b^2*c
os(x) - 2*a*b*c + (a^3*b^2 - a*b^4 - 4*a^2*c^3 - (8*a^3 - a*b^2)*c^2 - 2*(2
*a^4 - 3*a^2*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^
2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 -
4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*cos(x) - 1/2*sqrt(2)*((a^3*b^3 - a*b^5 +
4*a*b*c^4 + (4*a^2*b - b^3)*c^3 - (4*a^3*b + 5*a*b^3)*c^2 - (4*a^4*b - 5*a^
2*b^3 - b^5)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b
^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^
5 - 3*a^3*b^2 + 2*a*b^4)*c))*sin(x) - (a*b^3 - 4*a*b*c^2 - (4*a^2*b - b^3)*
c)*sin(x))*sqrt(-(2*a^2 - b^2 + 2*a*c + (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 -
 b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*
a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2
 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3 -
 (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)))
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.10, size = 1264, normalized size = 5.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(x)/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arcta
nh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a^2-3/(-4*
a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a
+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b-1/(a-b+c)/((
(-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+
b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/
2)+a-c)*(a-b+c))^(1/2))*a^2+3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/
2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*
(a-b+c))^(1/2))*a*b-1/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arct
an((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a+1/(-4*a*c
+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-
c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^2+1/(a-b+c)/(((-4
*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b
^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b-1/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2
)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+
a-c)*(a-b+c))^(1/2))*b^2+1/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)
*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b+2/(-
4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((
-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*a-c/(-4*a*c+
b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c
)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b-c/(a-b+c)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)
^(1/2)-a+c)*(a-b+c))^(1/2))-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/
2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*
(a-b+c))^(1/2))*c*a+c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*
(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))
^(1/2))*b-c/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(x)}{c\cos(x)^2 + b\cos(x) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] integrate(cos(x)/(c*cos(x)^2 + b*cos(x) + a), x)
```

mupad [B] time = 11.72, size = 5488, normalized size = 23.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(x)/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] atan(((tan(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 - 32*b
^3) + ((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2
- 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4
*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64
*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c
^2 - 32*b^2*c^2 + tan(x/2)*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2
*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c
^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10
*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^
3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192
*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*
a*b^2*c - 256*a^2*b*c))*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^
2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3
+ 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*
b^4*c)))^(1/2)*1i + (tan(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c +
 64*a^3 - 32*b^3) - ((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^
2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16
*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*
c)))^(1/2)*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b
^2 + 256*a^2*c^2 - 32*b^2*c^2 - tan(x/2)*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(
1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*
c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^
2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*
c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128
*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256
*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2
) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4
 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b
^2*c^2 + 10*a*b^4*c)))^(1/2)*1i)/(64*a*c - 64*a*b + 64*a^2 - (tan(x/2)*(96*
a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 - 32*b^3) + ((8*a^3*c + b*
(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2
*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 -
 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^3 + 128*a*c^3 +
 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 + ta
```

```
n(x/2)*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2
 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^
4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(6
4*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256
*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2
*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*
c))*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 -
6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c
^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2) + (ta
n(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 - 32*b^3) - ((8
*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2
*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*
a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^3 +
128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 - 32*b
^2*c^2 - tan(x/2)*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2
+ 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a
^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)
))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 64*a^
3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^2*c^
2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2*c -
 256*a^2*b*c))*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8
*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*
c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^
(1/2)))*((8*a^3*c + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^
2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b
^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*2
i + atan(((tan(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 -
32*b^3) + ((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*
c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 +
 b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)
*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a
^2*c^2 - 32*b^2*c^2 + tan(x/2)*((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4
 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a
^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2
+ 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^
2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 +
 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 +
 64*a*b^2*c - 256*a^2*b*c))*((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 -
2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*
c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 1
0*a*b^4*c)))^(1/2)*1i + (tan(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2
*c + 64*a^3 - 32*b^3) - ((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^
2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3
+ 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*
b^4*c)))^(1/2)*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a
```

```
^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 - tan(x/2)*((8*a^3*c - b*(-(4*a*c - b^2)^
3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*
a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 3
2*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*
b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 +
 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) -
 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*((8*a^3*c - b*(-(4*a*c - b^2)^3)^
(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2
*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a
^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*1i)/(64*a*c - 64*a*b + 64*a^2 - (tan(x/2)*
(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 - 32*b^3) + ((8*a^3*c
- b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*
(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c
^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^3 + 128*a*c
^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2
+ tan(x/2)*((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2
*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2
+ b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2
)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 +
 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192
*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^
2*b*c))*((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^
2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b
^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2) +
 (tan(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 - 32*b^3) -
 ((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a
*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2
- 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^
3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 -
32*b^2*c^2 - tan(x/2)*((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*
b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 +
16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^
4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 6
4*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^
2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2
*c - 256*a^2*b*c))*((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2
 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*
a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c
)))^(1/2)))*((8*a^3*c - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 - 2*a^2*b^2 + 8*a^
2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2
 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/
2)*2i
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(x)/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Timed out
```

3.17 $\int \frac{1}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=223

$$\frac{4c\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{b^2-4ac}\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{4c\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{b^2-4ac}\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}$$

```
[Out] 4*c*arctan((b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c-(-4*a*c+b^2)^
(1/2))^(1/2))/(-4*a*c+b^2)^(1/2)/(b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*c-(-
4*a*c+b^2)^(1/2))^(1/2)-4*c*arctan((b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2
*x)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2))/(-4*a*c+b^2)^(1/2)/(b-2*c+(-4*a*c+b^2
)^(1/2))^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2)
```

Rubi [A] time = 0.35, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {3249, 2659, 205}

$$\frac{4c\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{b^2-4ac}\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{4c\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{b^2-4ac}\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Cos[x] + c*Cos[x]^2)^(-1),x]
```

```
[Out] (4*c*ArcTan[(Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c - Sqr
t[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Sqrt
[b + 2*c - Sqrt[b^2 - 4*a*c]]) - (4*c*ArcTan[(Sqrt[b - 2*c + Sqrt[b^2 - 4*a
*c]]*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*Sqrt[
b - 2*c + Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
```

```
&& NeQ[a^2 - b^2, 0]
```

Rule 3249

```
Int[((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b_.) + cos[(d_.) + (e_.)*(x_)]^
(n2_.)*(c_.))^(-1), x_Symbol] :> Module[{q = Rt[b^2 - 4*a*c, 2]}, Dist[(2*c
)/q, Int[1/(b - q + 2*c*Cos[d + e*x]^n), x], x] - Dist[(2*c)/q, Int[1/(b +
q + 2*c*Cos[d + e*x]^n), x], x]] /; FreeQ[{a, b, c, d, e, n}, x] && EqQ[n2,
 2*n] && NeQ[b^2 - 4*a*c, 0]
```

Rubi steps

$$\int \frac{1}{a+b\cos(x)+c\cos^2(x)}\,dx = \frac{(2c)\int \frac{1}{b-\sqrt{b^2-4ac}+2c\cos(x)}\,dx}{\sqrt{b^2-4ac}} - \frac{(2c)\int \frac{1}{b+\sqrt{b^2-4ac}+2c\cos(x)}\,dx}{\sqrt{b^2-4ac}}$$

$$= \frac{(4c)\,\text{Subst}\left(\int \frac{1}{b+2c-\sqrt{b^2-4ac}+\left(b-2c-\sqrt{b^2-4ac}\right)x^2}\,dx, x, \tan\left(\frac{x}{2}\right)\right)}{\sqrt{b^2-4ac}} - \frac{(4c)\,\text{Subst}\left(\int \frac{}{b+2c \ldots}\right.}{}$$

$$= \frac{4c\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{\sqrt{b^2-4ac}\,\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}} - \frac{4c\tan^{-1}\ldots}{\sqrt{b^2-4ac}\,\sqrt{b-2c+\ldots}}$$

Mathematica [A] time = 0.41, size = 198, normalized size = 0.89

$$\frac{2\sqrt{2}\,c\left(\frac{\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}}+\frac{\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}-b+2c\right)}{\sqrt{2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b\sqrt{b^2-4ac}+2c(a+c)-b^2}}\right)}{\sqrt{b^2-4ac}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Cos[x] + c*Cos[x]^2)^(-1),x]
```

```
[Out] (2*Sqrt[2]*c*(ArcTanh[((b - 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2
+ 4*c*(a + c) - 2*b*Sqrt[b^2 - 4*a*c]]]/Sqrt[-b^2 + 2*c*(a + c) - b*Sqrt[b^
2 - 4*a*c]] + ArcTanh[((-b + 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2
 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c]]]/Sqrt[-b^2 + 2*c*(a + c) + b*Sqrt[b
^2 - 4*a*c]]))/Sqrt[b^2 - 4*a*c]
```

fricas [B] time = 2.28, size = 3493, normalized size = 15.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] 1/4*sqrt(2)*sqrt(-(b^2 - 2*a*c - 2*c^2 - (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2
- b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4
*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^
2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3
- (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c))*log(b^2*c*cos(x) + 2*b*c^2 -
(4*a*c^4 + (8*a^2 - b^2)*c^3 + 2*(2*a^3 - 3*a*b^2)*c^2 - (a^2*b^2 - b^4)*c)
*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2
*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 +
 2*a*b^4)*c))*cos(x) + 1/2*sqrt(2)*((a^2*b^4 - b^6 + 8*a*c^5 + 2*(12*a^2 -
b^2)*c^4 + 6*(4*a^3 - 3*a*b^2)*c^3 + (8*a^4 - 22*a^2*b^2 + 3*b^4)*c^2 - 2*(
3*a^3*b^2 - 4*a*b^4)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16
*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2
 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*sin(x) + (b^4 - 4*a*b^2*c)*sin(x))*sqr
t(-(b^2 - 2*a*c - 2*c^2 - (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*
(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^
2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 -
4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)
*c^2 - 2*(2*a^3 - 3*a*b^2)*c))) - 1/4*sqrt(2)*sqrt(-(b^2 - 2*a*c - 2*c^2 -
(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(
b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 -
 a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b
^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)
*c))*log(b^2*c*cos(x) + 2*b*c^2 - (4*a*c^4 + (8*a^2 - b^2)*c^3 + 2*(2*a^3 -
 3*a*b^2)*c^2 - (a^2*b^2 - b^4)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*
a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2
 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*cos(x) - 1/2*sqrt(2)*((a^2*
b^4 - b^6 + 8*a*c^5 + 2*(12*a^2 - b^2)*c^4 + 6*(4*a^3 - 3*a*b^2)*c^3 + (8*a
^4 - 22*a^2*b^2 + 3*b^4)*c^2 - 2*(3*a^3*b^2 - 4*a*b^4)*c)*sqrt(b^2/(a^4*b^2
 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3
- 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*sin(
x) + (b^4 - 4*a*b^2*c)*sin(x))*sqrt(-(b^2 - 2*a*c - 2*c^2 - (a^2*b^2 - b^4
- 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 -
2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2
*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b
^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c))) + 1/4*sqr
t(2)*sqrt(-(b^2 - 2*a*c - 2*c^2 + (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*
c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5
```

```
- (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4
)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^
2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c))*log(-b^2*c*cos(x) - 2*b*c^2 - (4*a*c
^4 + (8*a^2 - b^2)*c^3 + 2*(2*a^3 - 3*a*b^2)*c^2 - (a^2*b^2 - b^4)*c)*sqrt(
b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 -
 a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b
^4)*c))*cos(x) + 1/2*sqrt(2)*((a^2*b^4 - b^6 + 8*a*c^5 + 2*(12*a^2 - b^2)*c
^4 + 6*(4*a^3 - 3*a*b^2)*c^3 + (8*a^4 - 22*a^2*b^2 + 3*b^4)*c^2 - 2*(3*a^3*
b^2 - 4*a*b^4)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 -
 b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(
a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*sin(x) - (b^4 - 4*a*b^2*c)*sin(x))*sqrt(-(b^
2 - 2*a*c - 2*c^2 + (a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3
 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^
2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5
 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 -
 2*(2*a^3 - 3*a*b^2)*c))) - 1/4*sqrt(2)*sqrt(-(b^2 - 2*a*c - 2*c^2 + (a^2*b
^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a
^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2
)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)
))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c))*l
og(-b^2*c*cos(x) - 2*b*c^2 - (4*a*c^4 + (8*a^2 - b^2)*c^3 + 2*(2*a^3 - 3*a*
b^2)*c^2 - (a^2*b^2 - b^4)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2*b^4 + b^6 - 4*a*c^5
 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a^4 - 11*a^2*b^2 + b^
4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*cos(x) - 1/2*sqrt(2)*((a^2*b^4 -
 b^6 + 8*a*c^5 + 2*(12*a^2 - b^2)*c^4 + 6*(4*a^3 - 3*a*b^2)*c^3 + (8*a^4 -
22*a^2*b^2 + 3*b^4)*c^2 - 2*(3*a^3*b^2 - 4*a*b^4)*c)*sqrt(b^2/(a^4*b^2 - 2*
a^2*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(
8*a^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c))*sin(x) -
(b^4 - 4*a*b^2*c)*sin(x))*sqrt(-(b^2 - 2*a*c - 2*c^2 + (a^2*b^2 - b^4 - 4*a
*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)*sqrt(b^2/(a^4*b^2 - 2*a^2
*b^4 + b^6 - 4*a*c^5 - (16*a^2 - b^2)*c^4 - 12*(2*a^3 - a*b^2)*c^3 - 2*(8*a
^4 - 11*a^2*b^2 + b^4)*c^2 - 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c)))/(a^2*b^2 -
b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)))
```

giac [**B**] time = 91.06, size = 2954, normalized size = 13.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] (2*a^2*b^3 - 2*b^5 - 8*a^3*b*c - 12*a^2*b^2*c + 20*a*b^3*c + 4*b^4*c + 48*a
^3*c^2 - 48*a^2*b*c^2 - 24*a*b^2*c^2 - 6*b^3*c^2 + 32*a^2*c^3 + 24*a*b*c^3
+ 4*b^2*c^3 - 16*a*c^4 + 3*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(
a - b + c))*a^2*b^2 - 2*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a -
```

b + c))*a*b^3 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*b^4 - 12*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*c + 8*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b*c + 34*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^2*c + 6*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*b^3*c - 56*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*c^2 - 24*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a*b*c^2 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*b^2*c^2 + 20*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*a*c^3 + 3*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b - 2*(b^2 - 4*a*c)*a^2*b - 2*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b^2 - 5*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^3 + 2*(b^2 - 4*a*c)*b^3 + 6*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*c + 12*(b^2 - 4*a*c)*a^2*c + 10*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*b*c - 12*(b^2 - 4*a*c)*a*b*c - 4*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^2*c - 4*(b^2 - 4*a*c)*b^2*c + 28*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a*c^2 + 8*(b^2 - 4*a*c)*a*c^2 + 7*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b*c^2 + 6*(b^2 - 4*a*c)*b*c^2 - 10*sqrt(a^2 - a*b + b*c - c^2 + sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*c^3 - 4*(b^2 - 4*a*c)*c^3)*(pi*floor(1/2*x/pi + 1/2) + arctan(2*sqrt(1/2)*tan(1/2*x)/sqrt((2*a - 2*c + sqrt(-4*(a + b + c)*(a - b + c) + 4*(a - c)^2))/(a - b + c))))*abs(a - b + c)/(3*a^5*b^2 - 5*a^4*b^3 - 6*a^3*b^4 + 10*a^2*b^5 + 3*a*b^6 - 5*b^7 - 12*a^6*c + 20*a^5*b*c + 47*a^4*b^2*c - 60*a^3*b^3*c - 46*a^2*b^4*c + 40*a*b^5*c + 11*b^6*c - 92*a^5*c^2 + 80*a^4*b*c^2 + 182*a^3*b^2*c^2 - 94*a^2*b^3*c^2 - 78*a*b^4*c^2 - 6*b^5*c^2 - 184*a^4*c^3 + 56*a^3*b*c^3 + 166*a^2*b^2*c^3 + 36*a*b^3*c^3 - 6*b^4*c^3 - 120*a^3*c^4 - 48*a^2*b*c^4 + 23*a*b^2*c^4 + 11*b^3*c^4 + 4*a^2*c^5 - 44*a*b*c^5 - 5*b^2*c^5 + 20*a*c^6) - (2*a^2*b^3 - 2*b^5 - 8*a^3*b*c - 12*a^2*b^2*c + 20*a*b^3*c + 4*b^4*c + 48*a^3*c^2 - 48*a^2*b*c^2 - 24*a*b^2*c^2 - 6*b^3*c^2 + 32*a^2*c^3 + 24*a*b*c^3 + 4*b^2*c^3 - 16*a*c^4 - 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b^2 + 2*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^3 + 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*b^4 + 12*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^3*c - 8*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*b*c - 34*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*b^2*c - 6*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*b^3*c + 56*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a^2*c^2 + 24*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*b*c^2 + 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*b^2*c^2 - 20*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*a*c^3 + 3*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*b - 2*(b^2 - 4*a*c)*a^2*b - 2*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c

```
)*a*b^2 - 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqr
t(b^2 - 4*a*c)*b^3 + 2*(b^2 - 4*a*c)*b^3 + 6*sqrt(a^2 - a*b + b*c - c^2 - s
qrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*c + 12*(b^2 - 4*a*c)*a^
2*c + 10*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b
^2 - 4*a*c)*a*b*c - 12*(b^2 - 4*a*c)*a*b*c - 4*sqrt(a^2 - a*b + b*c - c^2 -
 sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^2*c - 4*(b^2 - 4*a*c)*b
^2*c + 28*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(
b^2 - 4*a*c)*a*c^2 + 8*(b^2 - 4*a*c)*a*c^2 + 7*sqrt(a^2 - a*b + b*c - c^2 -
 sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b*c^2 + 6*(b^2 - 4*a*c)*b
*c^2 - 10*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(
b^2 - 4*a*c)*c^3 - 4*(b^2 - 4*a*c)*c^3)*(pi*floor(1/2*x/pi + 1/2) + arctan(
2*sqrt(1/2)*tan(1/2*x)/sqrt((2*a - 2*c - sqrt(-4*(a + b + c)*(a - b + c) +
4*(a - c)^2))/(a - b + c))))*abs(a - b + c)/(3*a^5*b^2 - 5*a^4*b^3 - 6*a^3*
b^4 + 10*a^2*b^5 + 3*a*b^6 - 5*b^7 - 12*a^6*c + 20*a^5*b*c + 47*a^4*b^2*c -
 60*a^3*b^3*c - 46*a^2*b^4*c + 40*a*b^5*c + 11*b^6*c - 92*a^5*c^2 + 80*a^4*
b*c^2 + 182*a^3*b^2*c^2 - 94*a^2*b^3*c^2 - 78*a*b^4*c^2 - 6*b^5*c^2 - 184*a
^4*c^3 + 56*a^3*b*c^3 + 166*a^2*b^2*c^3 + 36*a*b^3*c^3 - 6*b^4*c^3 - 120*a^
3*c^4 - 48*a^2*b*c^4 + 23*a*b^2*c^4 + 11*b^3*c^4 + 4*a^2*c^5 - 44*a*b*c^5 -
 5*b^2*c^5 + 20*a*c^6)
```

maple [B] time = 0.10, size = 1262, normalized size = 5.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 1/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2
*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a+2/(-4*a*c+b^2)^(1/2)/(a-b+c
)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-
4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*a-1/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-
4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+
b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*a*b+1/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+
b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/
2)+a-c)*(a-b+c))^(1/2))*a*b-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/
2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*
(a-b+c))^(1/2))*c*a+1/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arct
an((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*a-1/(a-b+c)
/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4
*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b-3*c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4
*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b
^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b+1/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2
)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2
)-a+c)*(a-b+c))^(1/2))*b^2-1/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2
)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(
```

```
a-b+c))^(1/2))*b^2+3*c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)
*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c)
)^(1/2))*b-1/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c
)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b+c/(a-b+c)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)
^(1/2)-a+c)*(a-b+c))^(1/2))+2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/
2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c
)*(a-b+c))^(1/2))*c^2-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c
)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c
))^(1/2))*c^2+c/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-
b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{c\cos(x)^2 + b\cos(x) + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(c*cos(x)^2 + b*cos(x) + a), x)
```

mupad [B] time = 11.92, size = 5514, normalized size = 24.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + b*cos(x) + c*cos(x)^2),x)
```

```
[Out] - atan(((tan(x/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^2*c - 32*b^3 + 64
*c^3) + (-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c
^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 +
b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*
(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^
2*c^2 - 32*b^2*c^2 + tan(x/2)*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4
 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a
^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2
+ 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^
2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 +
 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 +
 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 +
 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3
*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 +
10*a*b^4*c)))^(1/2)*1i + (tan(x/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^
2*c - 32*b^3 + 64*c^3) - (-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*
```

```
a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^
3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*
a*b^4*c)))^(1/2)*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32
*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 - tan(x/2)*(-(8*a*c^3 + b*(-(4*a*c - b^
2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 +
16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c
- 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c -
64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^
3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c
) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 + b*(-(4*a*c - b^2)
^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16
*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c -
32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*1i)/(64*a*c - 64*b*c + 64*c^2 + (tan(x
/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^2*c - 32*b^3 + 64*c^3) + (-(8*a
*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c
)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*
b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^3 + 12
8*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 - 32*b^2
*c^2 + tan(x/2)*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 -
 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^
4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c))
)^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 64*a^3
*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^2*c^2
 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2*c -
256*a^2*b*c))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2
*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*
c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^
(1/2) - (tan(x/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^2*c - 32*b^3 + 64
*c^3) - (-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c
^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 +
b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*
(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^
2*c^2 - 32*b^2*c^2 - tan(x/2)*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4
 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a
^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2
+ 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^
2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 +
 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 +
 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 +
 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3
*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 +
10*a*b^4*c)))^(1/2)))*(-(8*a*c^3 + b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2
*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 +
 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b
^4*c)))^(1/2)*2i - atan(((tan(x/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^
```

2*c - 32*b^3 + 64*c^3) + (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*
a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^
3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*
a*b^4*c)))^(1/2)*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32
*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 + tan(x/2)*(-(8*a*c^3 - b*(-(4*a*c - b^
2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 +
16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c
- 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c -
64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^
3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c
) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 - b*(-(4*a*c - b^2)
^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16
*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c -
32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*1i + (tan(x/2)*(32*a*b^2 - 64*a^2*c -
128*b*c^2 + 96*b^2*c - 32*b^3 + 64*c^3) - (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)
^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^
2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*
a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^
3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 - tan(x/2)*(-(8*a*c^3
- b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*
(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c
^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c
^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^
3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*
c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 -
b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a
^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3
- 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*1i)/(64*a*c - 64*b*c
+ 64*c^2 + (tan(x/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^2*c - 32*b^3 +
64*c^3) + (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^
2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2
+ b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/
2)*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256
*a^2*c^2 - 32*b^2*c^2 + tan(x/2)*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) +
b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 3
2*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c
^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128
*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^
2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^
2 + 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^
4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*
a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2
+ 10*a*b^4*c)))^(1/2) - (tan(x/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^
2*c - 32*b^3 + 64*c^3) - (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1/2) + b^4 + 8*
a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^

```
3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*
a*b^4*c)))^(1/2)*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32
*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 - tan(x/2)*(-(8*a*c^3 - b*(-(4*a*c - b^
2)^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 +
16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c
- 32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)*(64*a*b^4 + 256*a*c^4 - 256*a^4*c -
64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^
3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c
) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 - b*(-(4*a*c - b^2)
^3)^(1/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16
*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c -
32*a^2*b^2*c^2 + 10*a*b^4*c)))^(1/2)))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^(1
/2) + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c
^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2
*b^2*c^2 + 10*a*b^4*c)))^(1/2)*2i
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Timed out
```

3.18 $\int \frac{\sec(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=245

$$-\frac{2c\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{a\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{2c\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{a\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}+\frac{\tanh^{-1}(\sin(x))}{a}$$

```
[Out] arctanh(sin(x))/a-2*c*arctan((b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b
+2*c-(-4*a*c+b^2)^(1/2))^(1/2))*(1+b/(-4*a*c+b^2)^(1/2))/a/(b-2*c-(-4*a*c+b
^2)^(1/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)-2*c*arctan((b-2*c+(-4*a*c
+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2))*(1-b/(-4*a*
c+b^2)^(1/2))/a/(b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/2))
^(1/2)
```

Rubi [A] time = 0.77, antiderivative size = 245, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.294, Rules used = {3257, 3293, 2659, 205, 3770}

$$-\frac{2c\left(\frac{b}{\sqrt{b^2-4ac}}+1\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{a\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}-\frac{2c\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{a\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}+\frac{\tanh^{-1}(\sin(x))}{a}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[x]/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (-2*c*(1 + b/Sqrt[b^2 - 4*a*c])*ArcTan[(Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*T
an[x/2])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/(a*Sqrt[b - 2*c - Sqrt[b^2 - 4
*a*c]]*Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]) - (2*c*(1 - b/Sqrt[b^2 - 4*a*c])*
ArcTan[(Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2
 - 4*a*c]]])/(a*Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c + Sqrt[b^2 -
 4*a*c]]) + ArcTanh[Sin[x]]/a
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
```

```
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3257

```
Int[cos[(d_.) + (e_.)*(x_)]^(m_.)*((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b
_.) + cos[(d_.) + (e_.)*(x_)]^(n2_.)*(c_.))^(p_), x_Symbol] :> Int[ExpandTr
ig[cos[d + e*x]^m*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n))^p, x], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && NeQ[b^2 - 4*a*c, 0] && Integ
ersQ[m, n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(\frac{-b-c\cos(x)}{a\left(a+b\cos(x)+c\cos^2(x)\right)}+\frac{\sec(x)}{a}\right)dx$$

$$= \frac{\int \frac{-b-c\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{a}+\frac{\int \sec(x)\,dx}{a}$$

$$= \frac{\tanh^{-1}(\sin(x))}{a}-\frac{\left(c\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\right)\int \frac{1}{b+\sqrt{b^2-4ac}+2c\cos(x)}\,dx}{a}-\frac{\left(c\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)\right)\int$$

$$= \frac{\tanh^{-1}(\sin(x))}{a}-\frac{\left(2c\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\right)\text{Subst}\left(\int \frac{1}{b+2c+\sqrt{b^2-4ac}+\left(b-2c+\sqrt{b^2-4ac}\right)x^2}\,dx,\right.}{a}$$

$$= -\frac{2c\left(1+\frac{b}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{a\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}}-\frac{2c\left(1-\frac{b}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-}}{\sqrt{b+}}\right.}{a\sqrt{b-2c+\sqrt{b^2-4ac}}\,\sqrt{b+2}$$

Mathematica [A] time = 0.67, size = 281, normalized size = 1.15

$$\frac{\frac{\sqrt{2}\,c\left(\sqrt{b^2-4ac}-b\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\,\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}}-\frac{\sqrt{2}\,c\left(\sqrt{b^2-4ac}+b\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}-b+2c\right)}{\sqrt{2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\,\sqrt{b\sqrt{b^2-4ac}+2c(a+c)-b^2}}-\log\left(\cos\left(\frac{x}{2}\right)-\sin\left(\frac{x}{2}\right)\right)+}{a}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[x]/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] ((Sqrt[2]*c*(-b + Sqrt[b^2 - 4*a*c])*ArcTanh[((b - 2*c + Sqrt[b^2 - 4*a*c])
*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) - 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 -
 4*a*c]*Sqrt[-b^2 + 2*c*(a + c) - b*Sqrt[b^2 - 4*a*c]]) - (Sqrt[2]*c*(b + S
qrt[b^2 - 4*a*c])*ArcTanh[((-b + 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2
*b^2 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2
+ 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c]]) - Log[Cos[x/2] - Sin[x/2]] + Log[Cos[
x/2] + Sin[x/2]])/a
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.14, size = 1957, normalized size = 7.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(x)/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] c/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2
*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))+c/(a-b+c)/(((-4*a*c+b^2)^(1/2
)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(
a-b+c))^(1/2))+1/a/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan(
(a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2-1/a/(-4*a*
c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b
-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2*b+1/a/(-4*a*c+
b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*
tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2*b+2/a/(-4*a*c+b^2)
^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*ta
n(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*b^2-2/a/(-4*a*c+b^2)^(
1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/
2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c*b^2+1/(-4*a*c+b^2)^(1/2)/(
a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)
/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^2-1/(a-b+c)/(((-4*a*c+b^2)^(1/
2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c
)*(a-b+c))^(1/2))*b-1/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arct
an((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b-1/(-4*a*c
+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2-2/(-4*a*c+b^2)^(1
/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2+2/(-4*a*c+b^2)^(1/2)/(a
-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/((
(-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2-1/a*ln(tan(1/2*x)-1)+1/a*ln(tan
(1/2*x)+1)+1/a/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b
```

```
+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2+1/a/(a-b+c)/((
(-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2+1/a/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*
a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)
^(1/2)+a-c)*(a-b+c))^(1/2))*b^3-2/a*b/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-
b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^
(1/2))*c+1/a/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b
-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^2-1/a/(-4*a*c+b^
2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*
tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^3-2/a*b/(a-b+c)/(((-
4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^
2)^(1/2)+a-c)*(a-b+c))^(1/2))*c-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)
^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)
-a+c)*(a-b+c))^(1/2))*c*a+2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)
+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a
-b+c))^(1/2))*c*a+c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a
-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))
^(1/2))*b-c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(
1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{4a\int \frac{2bc\cos(3x)^2+2bc\cos(x)^2+2bc\sin(3x)^2+2bc\sin(x)^2+4(2ab+bc)\cos(2x)^2+c^2\cos(x)+4(2ab+}{ac^2\cos(4x)^2+4ab^2\cos(3x)^2+4ab^2\cos(x)^2+ac^2\sin(4x)^2+4ab^2\sin(3x)^2+4ab^2\sin(x)^2+4abc\cos(x)+ac^2+4\left(4a^3+4a^2c+ac^2\right)\cos(2x)^2+4\left(4\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] -1/2*(2*a*integrate(2*(2*b*c*cos(3*x)^2 + 2*b*c*cos(x)^2 + 2*b*c*sin(3*x)^2
 + 2*b*c*sin(x)^2 + 4*(2*a*b + b*c)*cos(2*x)^2 + c^2*cos(x) + 4*(2*a*b + b*
c)*sin(2*x)^2 + 2*(2*b^2 + 2*a*c + c^2)*sin(2*x)*sin(x) + (c^2*cos(3*x) + 2
*b*c*cos(2*x) + c^2*cos(x))*cos(4*x) + (4*b*c*cos(x) + c^2 + 2*(2*b^2 + 2*a
*c + c^2)*cos(2*x))*cos(3*x) + 2*(b*c + (2*b^2 + 2*a*c + c^2)*cos(x))*cos(2
*x) + (c^2*sin(3*x) + 2*b*c*sin(2*x) + c^2*sin(x))*sin(4*x) + 2*(2*b*c*sin(
x) + (2*b^2 + 2*a*c + c^2)*sin(2*x))*sin(3*x))/(a*c^2*cos(4*x)^2 + 4*a*b^2*
cos(3*x)^2 + 4*a*b^2*cos(x)^2 + a*c^2*sin(4*x)^2 + 4*a*b^2*sin(3*x)^2 + 4*a
*b^2*sin(x)^2 + 4*a*b*c*cos(x) + a*c^2 + 4*(4*a^3 + 4*a^2*c + a*c^2)*cos(2*
x)^2 + 4*(4*a^3 + 4*a^2*c + a*c^2)*sin(2*x)^2 + 8*(2*a^2*b + a*b*c)*sin(2*x
)*sin(x) + 2*(2*a*b*c*cos(3*x) + 2*a*b*c*cos(x) + a*c^2 + 2*(2*a^2*c + a*c^
2)*cos(2*x))*cos(4*x) + 4*(2*a*b^2*cos(x) + a*b*c + 2*(2*a^2*b + a*b*c)*cos
(2*x))*cos(3*x) + 4*(2*a^2*c + a*c^2 + 2*(2*a^2*b + a*b*c)*cos(x))*cos(2*x)
 + 4*(a*b*c*sin(3*x) + a*b*c*sin(x) + (2*a^2*c + a*c^2)*sin(2*x))*sin(4*x)
+ 8*(a*b^2*sin(x) + (2*a^2*b + a*b*c)*sin(2*x))*sin(3*x)), x) - log(cos(x)^
2 + sin(x)^2 + 2*sin(x) + 1) + log(cos(x)^2 + sin(x)^2 - 2*sin(x) + 1))/a
```

mupad [B] time = 13.55, size = 20126, normalized size = 82.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(x)*(a + b*cos(x) + c*cos(x)^2)),x)
```

```
[Out] (2*atanh((16384*b^4*tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131072*b^3*c +
 16384*b^4 + 540672*c^4 - (16384*b^5)/a + 262144*a^2*c^2 + (147456*c^5)/a -
 360448*b^2*c^2 - (147456*b*c^4)/a + (49152*b^4*c)/a - (32768*b^5*c)/a^2 -
(262144*b^2*c^3)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + (32768*b^3*
c^3)/a^2 + (32768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c) + (540672
*c^4*tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131072*b^3*c + 16384*b^4 + 54
0672*c^4 - (16384*b^5)/a + 262144*a^2*c^2 + (147456*c^5)/a - 360448*b^2*c^2
 - (147456*b*c^4)/a + (49152*b^4*c)/a - (32768*b^5*c)/a^2 - (262144*b^2*c^3
)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + (32768*b^3*c^3)/a^2 + (327
68*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c) - (16384*b^5*tan(x/2))/(
16384*a*b^4 + 540672*a*c^4 - 147456*b*c^4 + 49152*b^4*c - 16384*b^5 + 14745
6*c^5 + 655360*a^2*c^3 + 262144*a^3*c^2 - 262144*b^2*c^3 + 229376*b^3*c^2 -
 360448*a*b^2*c^2 - 262144*a^2*b*c^2 - 131072*a^2*b^2*c - (32768*b^5*c)/a -
 (32768*b^2*c^4)/a + (32768*b^3*c^3)/a + (32768*b^4*c^2)/a - 393216*a*b*c^3
 + 131072*a*b^3*c) + (147456*c^5*tan(x/2))/(16384*a*b^4 + 540672*a*c^4 - 14
7456*b*c^4 + 49152*b^4*c - 16384*b^5 + 147456*c^5 + 655360*a^2*c^3 + 262144
*a^3*c^2 - 262144*b^2*c^3 + 229376*b^3*c^2 - 360448*a*b^2*c^2 - 262144*a^2*
b*c^2 - 131072*a^2*b^2*c - (32768*b^5*c)/a - (32768*b^2*c^4)/a + (32768*b^3
*c^3)/a + (32768*b^4*c^2)/a - 393216*a*b*c^3 + 131072*a*b^3*c) + (262144*a^
2*c^2*tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131072*b^3*c + 16384*b^4 + 5
40672*c^4 - (16384*b^5)/a + 262144*a^2*c^2 + (147456*c^5)/a - 360448*b^2*c^
2 - (147456*b*c^4)/a + (49152*b^4*c)/a - (32768*b^5*c)/a^2 - (262144*b^2*c^
3)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + (32768*b^3*c^3)/a^2 + (32
768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c) - (360448*b^2*c^2*tan(x
/2))/(655360*a*c^3 - 393216*b*c^3 + 131072*b^3*c + 16384*b^4 + 540672*c^4 -
 (16384*b^5)/a + 262144*a^2*c^2 + (147456*c^5)/a - 360448*b^2*c^2 - (147456
*b*c^4)/a + (49152*b^4*c)/a - (32768*b^5*c)/a^2 - (262144*b^2*c^3)/a + (229
376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + (32768*b^3*c^3)/a^2 + (32768*b^4*c^2
)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c) - (147456*b*c^4*tan(x/2))/(16384*a
*b^4 + 540672*a*c^4 - 147456*b*c^4 + 49152*b^4*c - 16384*b^5 + 147456*c^5 +
 655360*a^2*c^3 + 262144*a^3*c^2 - 262144*b^2*c^3 + 229376*b^3*c^2 - 360448
*a*b^2*c^2 - 262144*a^2*b*c^2 - 131072*a^2*b^2*c - (32768*b^5*c)/a - (32768
*b^2*c^4)/a + (32768*b^3*c^3)/a + (32768*b^4*c^2)/a - 393216*a*b*c^3 + 1310
72*a*b^3*c) + (49152*b^4*c*tan(x/2))/(16384*a*b^4 + 540672*a*c^4 - 147456*b
*c^4 + 49152*b^4*c - 16384*b^5 + 147456*c^5 + 655360*a^2*c^3 + 262144*a^3*c
^2 - 262144*b^2*c^3 + 229376*b^3*c^2 - 360448*a*b^2*c^2 - 262144*a^2*b*c^2
- 131072*a^2*b^2*c - (32768*b^5*c)/a - (32768*b^2*c^4)/a + (32768*b^3*c^3)/
```

a + (32768*b^4*c^2)/a - 393216*a*b*c^3 + 131072*a*b^3*c) - (32768*b^5*c*tan(x/2))/(147456*a*c^5 - 16384*a*b^5 - 32768*b^5*c + 16384*a^2*b^4 + 540672*a^2*c^4 + 655360*a^3*c^3 + 262144*a^4*c^2 - 32768*b^2*c^4 + 32768*b^3*c^3 + 32768*b^4*c^2 - 262144*a*b^2*c^3 + 229376*a*b^3*c^2 - 393216*a^2*b*c^3 + 131072*a^2*b^3*c - 262144*a^3*b*c^2 - 131072*a^3*b^2*c - 360448*a^2*b^2*c^2 - 147456*a*b*c^4 + 49152*a*b^4*c) - (262144*b^2*c^3*tan(x/2))/(16384*a*b^4 + 540672*a*c^4 - 147456*b*c^4 + 49152*b^4*c - 16384*b^5 + 147456*c^5 + 655360*a^2*c^3 + 262144*a^3*c^2 - 262144*b^2*c^3 + 229376*b^3*c^2 - 360448*a*b^2*c^2 - 262144*a^2*b*c^2 - 131072*a^2*b^2*c - (32768*b^5*c)/a - (32768*b^2*c^4)/a + (32768*b^3*c^3)/a + (32768*b^4*c^2)/a - 393216*a*b*c^3 + 131072*a*b^3*c) + (229376*b^3*c^2*tan(x/2))/(16384*a*b^4 + 540672*a*c^4 - 147456*b*c^4 + 49152*b^4*c - 16384*b^5 + 147456*c^5 + 655360*a^2*c^3 + 262144*a^3*c^2 - 262144*b^2*c^3 + 229376*b^3*c^2 - 360448*a*b^2*c^2 - 262144*a^2*b*c^2 - 131072*a^2*b^2*c - (32768*b^5*c)/a - (32768*b^2*c^4)/a + (32768*b^3*c^3)/a + (32768*b^4*c^2)/a - 393216*a*b*c^3 + 131072*a*b^3*c) + (655360*a*c^3*tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131072*b^3*c + 16384*b^4 + 540672*c^4 - (16384*b^5)/a + 262144*a^2*c^2 + (147456*c^5)/a - 360448*b^2*c^2 - (147456*b*c^4)/a + (49152*b^4*c)/a - (32768*b^5*c)/a^2 - (262144*b^2*c^3)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + (32768*b^3*c^3)/a^2 + (32768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c) - (393216*b*c^3*tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131072*b^3*c + 16384*b^4 + 540672*c^4 - (16384*b^5)/a + 262144*a^2*c^2 + (147456*c^5)/a - 360448*b^2*c^2 - (147456*b*c^4)/a + (49152*b^4*c)/a - (32768*b^5*c)/a^2 - (262144*b^2*c^3)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + (32768*b^3*c^3)/a^2 + (32768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c) + (131072*b^3*c*tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131072*b^3*c + 16384*b^4 + 540672*c^4 - (16384*b^5)/a + 262144*a^2*c^2 + (147456*c^5)/a - 360448*b^2*c^2 - (147456*b*c^4)/a + (49152*b^4*c)/a - (32768*b^5*c)/a^2 - (262144*b^2*c^3)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + (32768*b^3*c^3)/a^2 + (32768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c) - (32768*b^2*c^4*tan(x/2))/(147456*a*c^5 - 16384*a*b^5 - 32768*b^5*c + 16384*a^2*b^4 + 540672*a^2*c^4 + 655360*a^3*c^3 + 262144*a^4*c^2 - 32768*b^2*c^4 + 32768*b^3*c^3 + 32768*b^4*c^2 - 262144*a*b^2*c^3 + 229376*a*b^3*c^2 - 393216*a^2*b*c^3 + 131072*a^2*b^3*c - 262144*a^3*b*c^2 - 131072*a^3*b^2*c - 360448*a^2*b^2*c^2 - 147456*a*b*c^4 + 49152*a*b^4*c) + (32768*b^3*c^3*tan(x/2))/(147456*a*c^5 - 16384*a*b^5 - 32768*b^5*c + 16384*a^2*b^4 + 540672*a^2*c^4 + 655360*a^3*c^3 + 262144*a^4*c^2 - 32768*b^2*c^4 + 32768*b^3*c^3 + 32768*b^4*c^2 - 262144*a*b^2*c^3 + 229376*a*b^3*c^2 - 393216*a^2*b*c^3 + 131072*a^2*b^3*c - 262144*a^3*b*c^2 - 131072*a^3*b^2*c - 360448*a^2*b^2*c^2 - 147456*a*b*c^4 + 49152*a*b^4*c) + (32768*b^4*c^2*tan(x/2))/(147456*a*c^5 - 16384*a*b^5 - 32768*b^5*c + 16384*a^2*b^4 + 540672*a^2*c^4 + 655360*a^3*c^3 + 262144*a^4*c^2 - 32768*b^2*c^4 + 32768*b^3*c^3 + 32768*b^4*c^2 - 262144*a*b^2*c^3 + 229376*a*b^3*c^2 - 393216*a^2*b*c^3 + 131072*a^2*b^3*c - 262144*a^3*b*c^2 - 131072*a^3*b^2*c - 360448*a^2*b^2*c^2 - 147456*a*b*c^4 + 49152*a*b^4*c) - (262144*a*b*c^2*tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131072*b^3*c + 16384*b^4 + 540672*c^4 - (16384*b^5)/a + 262144*a^2*

```
c^2 + (147456*c^5)/a - 360448*b^2*c^2 - (147456*b*c^4)/a + (49152*b^4*c)/a
- (32768*b^5*c)/a^2 - (262144*b^2*c^3)/a + (229376*b^3*c^2)/a - (32768*b^2*
c^4)/a^2 + (32768*b^3*c^3)/a^2 + (32768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131
072*a*b^2*c) - (131072*a*b^2*c*tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131
072*b^3*c + 16384*b^4 + 540672*c^4 - (16384*b^5)/a + 262144*a^2*c^2 + (1474
56*c^5)/a - 360448*b^2*c^2 - (147456*b*c^4)/a + (49152*b^4*c)/a - (32768*b^
5*c)/a^2 - (262144*b^2*c^3)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 +
(32768*b^3*c^3)/a^2 + (32768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c
)))/a - atan(-((((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2
) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2
 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16
*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c
^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a*c^5 - 49152*a*b^5 - 3
2768*b^5*c + 24576*b^6 + 32768*a^2*b^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 25
3952*a^3*c^3 + 98304*a^4*c^2 - 8192*b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2
 + (tan(x/2)*(49152*a*b^6 - 65536*a^6*c + 16384*b^6*c - 16384*b^7 - 65536*a
^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 2
12992*a^3*c^4 + 671744*a^4*c^3 + 245760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5
*c^2 + 98304*a*b^2*c^4 - 65536*a*b^3*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c
^4 - 393216*a^2*b^4*c - 1081344*a^3*b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b
*c^2 - 327680*a^4*b^2*c + 344064*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 557056*
a^3*b^2*c^2 + 98304*a*b^5*c + 196608*a^5*b*c) + ((8*a^2*c^4 - b^6 + 8*a^3*c
^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3
*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2
)*(57344*a^3*b^5 - 24576*a^2*b^6 - 40960*a^4*b^4 + 8192*a^5*b^3 - 98304*a^3
*c^5 - 425984*a^4*c^4 - 557056*a^5*c^3 - 229376*a^6*c^2 + 49152*a^2*b^5*c +
 196608*a^3*b*c^4 + 90112*a^3*b^4*c + 622592*a^4*b*c^3 - 327680*a^4*b^3*c +
 393216*a^5*b*c^2 + 221184*a^5*b^2*c + tan(x/2)*((8*a^2*c^4 - b^6 + 8*a^3*c
^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3
*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2
)*(65536*a^8*c + 16384*a^2*b^7 - 49152*a^3*b^6 + 65536*a^4*b^5 - 65536*a^5*
b^4 + 49152*a^6*b^3 - 16384*a^7*b^2 + 196608*a^4*c^5 + 131072*a^5*c^4 - 262
144*a^6*c^3 - 131072*a^7*c^2 - 16384*a^2*b^6*c - 114688*a^3*b^5*c - 65536*a
^4*b*c^4 + 376832*a^4*b^4*c + 720896*a^5*b*c^3 - 409600*a^5*b^3*c + 589824*
a^6*b*c^2 + 294912*a^6*b^2*c + 16384*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 1146
88*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*a^3*b^4*c^2 - 557056*a^4*b^2*c^
3 + 16384*a^4*b^3*c^2 - 655360*a^5*b^2*c^2 - 196608*a^7*b*c) + 24576*a^2*b^
2*c^4 - 49152*a^2*b^3*c^3 + 106496*a^3*b^2*c^3 - 352256*a^3*b^3*c^2 + 17203
2*a^4*b^2*c^2 - 32768*a^6*b*c))*((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*
c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2)
- 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^
```

4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b
^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2) + 24576*a*b^2*
c^3 + 237568*a*b^3*c^2 - 458752*a^2*b*c^3 + 262144*a^2*b^3*c - 270336*a^3*b
*c^2 - 155648*a^3*b^2*c + 16384*a^2*b^2*c^2 - 122880*a*b*c^4 - 114688*a*b^4
*c + 32768*a^4*b*c) + tan(x/2)*(8192*a*b^4 - 73728*a*c^4 - 57344*b*c^4 + 40
960*b^4*c - 8192*b^5 + 24576*c^5 - 81920*a^2*c^3 + 16384*a^3*c^2 + 81920*b^
2*c^3 - 81920*b^3*c^2 - 81920*a*b^2*c^2 + 81920*a^2*b*c^2 - 32768*a^2*b^2*c
 + 163840*a*b*c^3))*((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^
(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2
*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6
+ 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b
^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*1i - (((8*a^2*c^4 - b^6 +
8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-
(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^
2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 +
 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)
))^(1/2)*(24576*a*c^5 - 49152*a*b^5 - 32768*b^5*c + 24576*b^6 + 32768*a^2*b
^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 253952*a^3*c^3 + 98304*a^4*c^2 - 8192*
b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 - (tan(x/2)*(49152*a*b^6 - 65536*a^
6*c + 16384*b^6*c - 16384*b^7 - 65536*a^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b
^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 212992*a^3*c^4 + 671744*a^4*c^3 + 245
760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5*c^2 + 98304*a*b^2*c^4 - 65536*a*b^3
*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c^4 - 393216*a^2*b^4*c - 1081344*a^3*
b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a^4*b^2*c + 344064*a^2
*b^2*c^3 + 180224*a^2*b^3*c^2 + 557056*a^3*b^2*c^2 + 98304*a*b^5*c + 196608
*a^5*b*c) + ((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) +
b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8
*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4
*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 -
 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a^2*b^6 - 57344*a^3*b^5 + 4
0960*a^4*b^4 - 8192*a^5*b^3 + 98304*a^3*c^5 + 425984*a^4*c^4 + 557056*a^5*c
^3 + 229376*a^6*c^2 - 49152*a^2*b^5*c - 196608*a^3*b*c^4 - 90112*a^3*b^4*c
- 622592*a^4*b*c^3 + 327680*a^4*b^3*c - 393216*a^5*b*c^2 - 221184*a^5*b^2*c
 + tan(x/2)*((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) +
b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8
*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4
*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 -
 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(65536*a^8*c + 16384*a^2*b^7 - 491
52*a^3*b^6 + 65536*a^4*b^5 - 65536*a^5*b^4 + 49152*a^6*b^3 - 16384*a^7*b^2
+ 196608*a^4*c^5 + 131072*a^5*c^4 - 262144*a^6*c^3 - 131072*a^7*c^2 - 16384
*a^2*b^6*c - 114688*a^3*b^5*c - 65536*a^4*b*c^4 + 376832*a^4*b^4*c + 720896
*a^5*b*c^3 - 409600*a^5*b^3*c + 589824*a^6*b*c^2 + 294912*a^6*b^2*c + 16384
*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 114688*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 +
 196608*a^3*b^4*c^2 - 557056*a^4*b^2*c^3 + 16384*a^4*b^3*c^2 - 655360*a^5*b
^2*c^2 - 196608*a^7*b*c) - 24576*a^2*b^2*c^4 + 49152*a^2*b^3*c^3 - 106496*a

^3*b^2*c^3 + 352256*a^3*b^3*c^2 - 172032*a^4*b^2*c^2 + 32768*a^6*b*c))*((8*
a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^
2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b
c(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^
3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 -
 32*a^4*b^2*c^2)))^(1/2) + 24576*a*b^2*c^3 + 237568*a*b^3*c^2 - 458752*a^2*
b*c^3 + 262144*a^2*b^3*c - 270336*a^3*b*c^2 - 155648*a^3*b^2*c + 16384*a^2*
b^2*c^2 - 122880*a*b*c^4 - 114688*a*b^4*c + 32768*a^4*b*c) - tan(x/2)*(8192
*a*b^4 - 73728*a*c^4 - 57344*b*c^4 + 40960*b^4*c - 8192*b^5 + 24576*c^5 - 8
1920*a^2*c^3 + 16384*a^3*c^2 + 81920*b^2*c^3 - 81920*b^3*c^2 - 81920*a*b^2*
c^2 + 81920*a^2*b*c^2 - 32768*a^2*b^2*c + 163840*a*b*c^3))*((8*a^2*c^4 - b^
6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^
2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c
 - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c
^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*
c^2)))^(1/2)*1i)/((((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(
1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*
c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 +
 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^
4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a*c^5 - 49152*a*b^5
 - 32768*b^5*c + 24576*b^6 + 32768*a^2*b^4 - 8192*a^3*b^3 + 180224*a^2*c^4 +
 253952*a^3*c^3 + 98304*a^4*c^2 - 8192*b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*
c^2 + (tan(x/2)*(49152*a*b^6 - 65536*a^6*c + 16384*b^6*c - 16384*b^7 - 6553
6*a^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b^3 + 16384*a^5*b^2 - 147456*a^2*c^5
 + 212992*a^3*c^4 + 671744*a^4*c^3 + 245760*a^5*c^2 - 16384*b^4*c^3 + 16384*
b^5*c^2 + 98304*a*b^2*c^4 - 65536*a*b^3*c^3 - 180224*a*b^4*c^2 + 49152*a^2*
b*c^4 - 393216*a^2*b^4*c - 1081344*a^3*b*c^3 + 475136*a^3*b^3*c - 802816*a^
4*b*c^2 - 327680*a^4*b^2*c + 344064*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 5570
56*a^3*b^2*c^2 + 98304*a*b^5*c + 196608*a^5*b*c) + ((8*a^2*c^4 - b^6 + 8*a^
3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a
*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3
)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*
a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(
1/2)*(57344*a^3*b^5 - 24576*a^2*b^6 - 40960*a^4*b^4 + 8192*a^5*b^3 - 98304*
a^3*c^5 - 425984*a^4*c^4 - 557056*a^5*c^3 - 229376*a^6*c^2 + 49152*a^2*b^5*
c + 196608*a^3*b*c^4 + 90112*a^3*b^4*c + 622592*a^4*b*c^3 - 327680*a^4*b^3*
c + 393216*a^5*b*c^2 + 221184*a^5*b^2*c + tan(x/2)*((8*a^2*c^4 - b^6 + 8*a^
3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a
*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3
)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*
a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(
1/2)*(65536*a^8*c + 16384*a^2*b^7 - 49152*a^3*b^6 + 65536*a^4*b^5 - 65536*a
^5*b^4 + 49152*a^6*b^3 - 16384*a^7*b^2 + 196608*a^4*c^5 + 131072*a^5*c^4 -
262144*a^6*c^3 - 131072*a^7*c^2 - 16384*a^2*b^6*c - 114688*a^3*b^5*c - 6553
6*a^4*b*c^4 + 376832*a^4*b^4*c + 720896*a^5*b*c^3 - 409600*a^5*b^3*c + 5898

24*a^6*b*c^2 + 294912*a^6*b^2*c + 16384*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 1
14688*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*a^3*b^4*c^2 - 557056*a^4*b^2
*c^3 + 16384*a^4*b^3*c^2 - 655360*a^5*b^2*c^2 - 196608*a^7*b*c) + 24576*a^2
*b^2*c^4 - 49152*a^2*b^3*c^3 + 106496*a^3*b^2*c^3 - 352256*a^3*b^3*c^2 + 17
2032*a^4*b^2*c^2 - 32768*a^6*b*c))*((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4
*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/
2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4
*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^
5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2) + 24576*a*b
^2*c^3 + 237568*a*b^3*c^2 - 458752*a^2*b*c^3 + 262144*a^2*b^3*c - 270336*a^
3*b*c^2 - 155648*a^3*b^2*c + 16384*a^2*b^2*c^2 - 122880*a*b*c^4 - 114688*a*
b^4*c + 32768*a^4*b*c) + tan(x/2)*(8192*a*b^4 - 73728*a*c^4 - 57344*b*c^4 +
 40960*b^4*c - 8192*b^5 + 24576*c^5 - 81920*a^2*c^3 + 16384*a^3*c^2 + 81920
*b^2*c^3 - 81920*b^3*c^2 - 81920*a*b^2*c^2 + 81920*a^2*b*c^2 - 32768*a^2*b^
2*c + 163840*a*b*c^3))*((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^
3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*
b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b
^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^
2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2) + (((8*a^2*c^4 - b^6 +
8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-
(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^
2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 +
 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)
))^(1/2)*(24576*a*c^5 - 49152*a*b^5 - 32768*b^5*c + 24576*b^6 + 32768*a^2*b
^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 253952*a^3*c^3 + 98304*a^4*c^2 - 8192*
b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 - (tan(x/2)*(49152*a*b^6 - 65536*a^
6*c + 16384*b^6*c - 16384*b^7 - 65536*a^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b
^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 212992*a^3*c^4 + 671744*a^4*c^3 + 245
760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5*c^2 + 98304*a*b^2*c^4 - 65536*a*b^3
*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c^4 - 393216*a^2*b^4*c - 1081344*a^3*
b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a^4*b^2*c + 344064*a^2
*b^2*c^3 + 180224*a^2*b^3*c^2 + 557056*a^3*b^2*c^2 + 98304*a*b^5*c + 196608
*a^5*b*c) + ((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) +
b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8
*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4
*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 -
 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a^2*b^6 - 57344*a^3*b^5 + 4
0960*a^4*b^4 - 8192*a^5*b^3 + 98304*a^3*c^5 + 425984*a^4*c^4 + 557056*a^5*c
^3 + 229376*a^6*c^2 - 49152*a^2*b^5*c - 196608*a^3*b*c^4 - 90112*a^3*b^4*c
- 622592*a^4*b*c^3 + 327680*a^4*b^3*c - 393216*a^5*b*c^2 - 221184*a^5*b^2*c
 + tan(x/2)*((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) +
b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8
*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4
*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 -
 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(65536*a^8*c + 16384*a^2*b^7 - 491

52*a^3*b^6 + 65536*a^4*b^5 - 65536*a^5*b^4 + 49152*a^6*b^3 - 16384*a^7*b^2 + 196608*a^4*c^5 + 131072*a^5*c^4 - 262144*a^6*c^3 - 131072*a^7*c^2 - 16384 *a^2*b^6*c - 114688*a^3*b^5*c - 65536*a^4*b*c^4 + 376832*a^4*b^4*c + 720896 *a^5*b*c^3 - 409600*a^5*b^3*c + 589824*a^6*b*c^2 + 294912*a^6*b^2*c + 16384 *a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 114688*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*a^3*b^4*c^2 - 557056*a^4*b^2*c^3 + 16384*a^4*b^3*c^2 - 655360*a^5*b ^2*c^2 - 196608*a^7*b*c) - 24576*a^2*b^2*c^4 + 49152*a^2*b^3*c^3 - 106496*a ^3*b^2*c^3 + 352256*a^3*b^3*c^2 - 172032*a^4*b^2*c^2 + 32768*a^6*b*c))*((8* a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^ 2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b *c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^ 3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2) + 24576*a*b^2*c^3 + 237568*a*b^3*c^2 - 458752*a^2* b*c^3 + 262144*a^2*b^3*c - 270336*a^3*b*c^2 - 155648*a^3*b^2*c + 16384*a^2* b^2*c^2 - 122880*a*b*c^4 - 114688*a*b^4*c + 32768*a^4*b*c) - tan(x/2)*(8192 *a*b^4 - 73728*a*c^4 - 57344*b*c^4 + 40960*b^4*c - 8192*b^5 + 24576*c^5 - 8 1920*a^2*c^3 + 16384*a^3*c^2 + 81920*b^2*c^3 - 81920*b^3*c^2 - 81920*a*b^2* c^2 + 81920*a^2*b*c^2 - 32768*a^2*b^2*c + 163840*a*b*c^3))*((8*a^2*c^4 - b^ 6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^ 2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c ^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2* c^2)))^(1/2) - 49152*a*c^3 + 65536*b*c^3 - 49152*c^4 - 16384*b^2*c^2 + 1638 4*a*b*c^2))*((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 18*a^2*b^2*c^2 + 8 *a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4 *c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*2i + atan(-((tan(x/2)*(8192*a*b^4 - 73728*a*c^4 - 57344*b*c^4 + 40960*b^4*c - 8192*b^5 + 24576*c^5 - 81920*a^ 2*c^3 + 16384*a^3*c^2 + 81920*b^2*c^3 - 81920*b^3*c^2 - 81920*a*b^2*c^2 + 8 1920*a^2*b*c^2 - 32768*a^2*b^2*c + 163840*a*b*c^3) + (-(b^6 - 8*a^2*c^4 - 8 *a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a*c^5 - 49152*a*b^5 - 32768*b^5*c + 24576*b^6 + ((-(b^6 - 8* a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16 *a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^ 4*b^2*c^2)))^(1/2)*(57344*a^3*b^5 - 24576*a^2*b^6 - 40960*a^4*b^4 + 8192*a^ 5*b^3 - 98304*a^3*c^5 - 425984*a^4*c^4 - 557056*a^5*c^3 - 229376*a^6*c^2 + 49152*a^2*b^5*c + 196608*a^3*b*c^4 + 90112*a^3*b^4*c + 622592*a^4*b*c^3 - 3 27680*a^4*b^3*c + 393216*a^5*b*c^2 + 221184*a^5*b^2*c + 24576*a^2*b^2*c^4 - 49152*a^2*b^3*c^3 + 106496*a^3*b^2*c^3 - 352256*a^3*b^3*c^2 + 172032*a^4*b

^2*c^2 - 32768*a^6*b*c + tan(x/2)*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(65536*a^8*c + 16384*a^2*b^7 - 49152*a^3*b^6 + 65536*a^4*b^5 - 65536*a^5*b^4 + 49152*a^6*b^3 - 16384*a^7*b^2 + 196608*a^4*c^5 + 131072*a^5*c^4 - 262144*a^6*c^3 - 131072*a^7*c^2 - 16384*a^2*b^6*c - 114688*a^3*b^5*c - 65536*a^4*b*c^4 + 376832*a^4*b^4*c + 720896*a^5*b*c^3 - 409600*a^5*b^3*c + 589824*a^6*b*c^2 + 294912*a^6*b^2*c + 16384*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 114688*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*a^3*b^4*c^2 - 557056*a^4*b^2*c^3 + 16384*a^4*b^3*c^2 - 655360*a^5*b^2*c^2 - 196608*a^7*b*c)) + tan(x/2)*(49152*a*b^6 - 65536*a^6*c + 16384*b^6*c - 16384*b^7 - 65536*a^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 212992*a^3*c^4 + 671744*a^4*c^3 + 245760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5*c^2 + 98304*a*b^2*c^4 - 65536*a*b^3*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c^4 - 393216*a^2*b^4*c - 1081344*a^3*b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a^4*b^2*c + 344064*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 557056*a^3*b^2*c^2 + 98304*a*b^5*c + 196608*a^5*b*c))*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2) + 32768*a^2*b^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 253952*a^3*c^3 + 98304*a^4*c^2 - 8192*b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 + 24576*a*b^2*c^3 + 237568*a*b^3*c^2 - 458752*a^2*b*c^3 + 262144*a^2*b^3*c - 270336*a^3*b*c^2 - 155648*a^3*b^2*c + 16384*a^2*b^2*c^2 - 122880*a*b*c^4 - 114688*a*b^4*c + 32768*a^4*b*c))*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*1i + (tan(x/2)*(8192*a*b^4 - 73728*a*c^4 - 57344*b*c^4 + 40960*b^4*c - 8192*b^5 + 24576*c^5 - 81920*a^2*c^3 + 16384*a^3*c^2 + 81920*b^2*c^3 - 81920*b^3*c^2 - 81920*a*b^2*c^2 + 81920*a^2*b*c^2 - 32768*a^2*b^2*c + 163840*a*b*c^3) - (-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a*c^5 - 49152*a*b^5 - 32768*b^5*c + 24576*b^6 - ((-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a^2*b^6 - 57344*a^3*b^5 + 40960*a^4*b^4 - 8192*a^5*b^3 + 98304*a^3*c^5 + 425984*

a^4*c^4 + 557056*a^5*c^3 + 229376*a^6*c^2 - 49152*a^2*b^5*c - 196608*a^3*b*
c^4 - 90112*a^3*b^4*c - 622592*a^4*b*c^3 + 327680*a^4*b^3*c - 393216*a^5*b*
c^2 - 221184*a^5*b^2*c - 24576*a^2*b^2*c^4 + 49152*a^2*b^3*c^3 - 106496*a^3
*b^2*c^3 + 352256*a^3*b^3*c^2 - 172032*a^4*b^2*c^2 + 32768*a^6*b*c + tan(x/
2)*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2
+ 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c
 + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 3
2*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b
^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(65536*a^8*c + 16384*a^2*b^7 - 49152*a^3*b
^6 + 65536*a^4*b^5 - 65536*a^5*b^4 + 49152*a^6*b^3 - 16384*a^7*b^2 + 196608
*a^4*c^5 + 131072*a^5*c^4 - 262144*a^6*c^3 - 131072*a^7*c^2 - 16384*a^2*b^6
*c - 114688*a^3*b^5*c - 65536*a^4*b*c^4 + 376832*a^4*b^4*c + 720896*a^5*b*c
^3 - 409600*a^5*b^3*c + 589824*a^6*b*c^2 + 294912*a^6*b^2*c + 16384*a^2*b^4
*c^3 - 16384*a^2*b^5*c^2 - 114688*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*
a^3*b^4*c^2 - 557056*a^4*b^2*c^3 + 16384*a^4*b^3*c^2 - 655360*a^5*b^2*c^2 -
 196608*a^7*b*c)) + tan(x/2)*(49152*a*b^6 - 65536*a^6*c + 16384*b^6*c - 163
84*b^7 - 65536*a^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b^3 + 16384*a^5*b^2 - 14
7456*a^2*c^5 + 212992*a^3*c^4 + 671744*a^4*c^3 + 245760*a^5*c^2 - 16384*b^4
*c^3 + 16384*b^5*c^2 + 98304*a*b^2*c^4 - 65536*a*b^3*c^3 - 180224*a*b^4*c^2
 + 49152*a^2*b*c^4 - 393216*a^2*b^4*c - 1081344*a^3*b*c^3 + 475136*a^3*b^3*
c - 802816*a^4*b*c^2 - 327680*a^4*b^2*c + 344064*a^2*b^2*c^3 + 180224*a^2*b
^3*c^2 + 557056*a^3*b^2*c^2 + 98304*a*b^5*c + 196608*a^5*b*c))*(-(b^6 - 8*a
^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 +
 b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4
*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*
a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4
*b^2*c^2)))^(1/2) + 32768*a^2*b^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 253952*
a^3*c^3 + 98304*a^4*c^2 - 8192*b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 + 24
576*a*b^2*c^3 + 237568*a*b^3*c^2 - 458752*a^2*b*c^3 + 262144*a^2*b^3*c - 27
0336*a^3*b*c^2 - 155648*a^3*b^2*c + 16384*a^2*b^2*c^2 - 122880*a*b*c^4 - 11
4688*a*b^4*c + 32768*a^4*b*c))*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*
c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2)
+ 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^
4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b
^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*1i)/((tan(x/2)
*(8192*a*b^4 - 73728*a*c^4 - 57344*b*c^4 + 40960*b^4*c - 8192*b^5 + 24576*c
^5 - 81920*a^2*c^3 + 16384*a^3*c^2 + 81920*b^2*c^3 - 81920*b^3*c^2 - 81920*
a*b^2*c^2 + 81920*a^2*b*c^2 - 32768*a^2*b^2*c + 163840*a*b*c^3) - (-(b^6 -
8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^
3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(
-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 +
16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*
a^4*b^2*c^2)))^(1/2)*(24576*a*c^5 - 49152*a*b^5 - 32768*b^5*c + 24576*b^6 -
 ((-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 +
 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c

+ 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32
*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^
2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a^2*b^6 - 57344*a^3*b^5 + 40960*a^4*
b^4 - 8192*a^5*b^3 + 98304*a^3*c^5 + 425984*a^4*c^4 + 557056*a^5*c^3 + 2293
76*a^6*c^2 - 49152*a^2*b^5*c - 196608*a^3*b*c^4 - 90112*a^3*b^4*c - 622592*
a^4*b*c^3 + 327680*a^4*b^3*c - 393216*a^5*b*c^2 - 221184*a^5*b^2*c - 24576*
a^2*b^2*c^4 + 49152*a^2*b^3*c^3 - 106496*a^3*b^2*c^3 + 352256*a^3*b^3*c^2 -
172032*a^4*b^2*c^2 + 32768*a^6*b*c + tan(x/2)*(-(b^6 - 8*a^2*c^4 - 8*a^3*c
^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c
- b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3
*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2
)*(65536*a^8*c + 16384*a^2*b^7 - 49152*a^3*b^6 + 65536*a^4*b^5 - 65536*a^5*
b^4 + 49152*a^6*b^3 - 16384*a^7*b^2 + 196608*a^4*c^5 + 131072*a^5*c^4 - 262
144*a^6*c^3 - 131072*a^7*c^2 - 16384*a^2*b^6*c - 114688*a^3*b^5*c - 65536*a
^4*b*c^4 + 376832*a^4*b^4*c + 720896*a^5*b*c^3 - 409600*a^5*b^3*c + 589824*
a^6*b*c^2 + 294912*a^6*b^2*c + 16384*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 1146
88*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*a^3*b^4*c^2 - 557056*a^4*b^2*c^
3 + 16384*a^4*b^3*c^2 - 655360*a^5*b^2*c^2 - 196608*a^7*b*c)) + tan(x/2)*(4
9152*a*b^6 - 65536*a^6*c + 16384*b^6*c - 16384*b^7 - 65536*a^2*b^5 + 65536*
a^3*b^4 - 49152*a^4*b^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 212992*a^3*c^4 +
671744*a^4*c^3 + 245760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5*c^2 + 98304*a*
b^2*c^4 - 65536*a*b^3*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c^4 - 393216*a^2
*b^4*c - 1081344*a^3*b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a
^4*b^2*c + 344064*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 557056*a^3*b^2*c^2 + 9
8304*a*b^5*c + 196608*a^5*b*c))*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a
*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2)
+ 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b
^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*
b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2) + 32768*a^2*b
^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 253952*a^3*c^3 + 98304*a^4*c^2 - 8192*
b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 + 24576*a*b^2*c^3 + 237568*a*b^3*c^
2 - 458752*a^2*b*c^3 + 262144*a^2*b^3*c - 270336*a^3*b*c^2 - 155648*a^3*b^2
*c + 16384*a^2*b^2*c^2 - 122880*a*b*c^4 - 114688*a*b^4*c + 32768*a^4*b*c))*
(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6
*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c +
2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a
^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*
c^3 - 32*a^4*b^2*c^2)))^(1/2) - (tan(x/2)*(8192*a*b^4 - 73728*a*c^4 - 57344
*b*c^4 + 40960*b^4*c - 8192*b^5 + 24576*c^5 - 81920*a^2*c^3 + 16384*a^3*c^2
+ 81920*b^2*c^3 - 81920*b^3*c^2 - 81920*a*b^2*c^2 + 81920*a^2*b*c^2 - 3276
8*a^2*b^2*c + 163840*a*b*c^3) + (-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a
*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2)
+ 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b
^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*

b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(24576*a*c^5 - 49152*a*b^5 - 32768*b^5*c + 24576*b^6 + ((-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(57344*a^3*b^5 - 24576*a^2*b^6 - 40960*a^4*b^4 + 8192*a^5*b^3 - 98304*a^3*c^5 - 425984*a^4*c^4 - 557056*a^5*c^3 - 229376*a^6*c^2 + 49152*a^2*b^5*c + 196608*a^3*b*c^4 + 90112*a^3*b^4*c + 622592*a^4*b*c^3 - 327680*a^4*b^3*c + 393216*a^5*b*c^2 + 221184*a^5*b^2*c + 24576*a^2*b^2*c^4 - 49152*a^2*b^3*c^3 + 106496*a^3*b^2*c^3 - 352256*a^3*b^3*c^2 + 172032*a^4*b^2*c^2 - 32768*a^6*b*c + tan(x/2)*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2)*(65536*a^8*c + 16384*a^2*b^7 - 49152*a^3*b^6 + 65536*a^4*b^5 - 65536*a^5*b^4 + 49152*a^6*b^3 - 16384*a^7*b^2 + 196608*a^4*c^5 + 131072*a^5*c^4 - 262144*a^6*c^3 - 131072*a^7*c^2 - 16384*a^2*b^6*c - 114688*a^3*b^5*c - 65536*a^4*b*c^4 + 376832*a^4*b^4*c + 720896*a^5*b*c^3 - 409600*a^5*b^3*c + 589824*a^6*b*c^2 + 294912*a^6*b^2*c + 16384*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 114688*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*a^3*b^4*c^2 - 557056*a^4*b^2*c^3 + 16384*a^4*b^3*c^2 - 655360*a^5*b^2*c^2 - 196608*a^7*b*c)) + tan(x/2)*(49152*a*b^6 - 65536*a^6*c + 16384*b^6*c - 16384*b^7 - 65536*a^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 212992*a^3*c^4 + 671744*a^4*c^3 + 245760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5*c^2 + 98304*a*b^2*c^4 - 65536*a*b^3*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c^4 - 393216*a^2*b^4*c - 1081344*a^3*b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a^4*b^2*c + 344064*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 557056*a^3*b^2*c^2 + 98304*a*b^5*c + 196608*a^5*b*c))*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2) + 32768*a^2*b^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 253952*a^3*c^3 + 98304*a^4*c^2 - 8192*b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 + 24576*a*b^2*c^3 + 237568*a*b^3*c^2 - 458752*a^2*b*c^3 + 262144*a^2*b^3*c - 270336*a^3*b*c^2 - 155648*a^3*b^2*c + 16384*a^2*b^2*c^2 - 122880*a*b*c^4 - 114688*a*b^4*c + 32768*a^4*b*c))*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^(1/2) + 49152*a*c^3 - 65536*b*c^3 + 49152*c^4 + 16384*b^2*c^2 - 16384*a*b*c^2))*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^(1/2) - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b

```
*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^
3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 -
 32*a^4*b^2*c^2)))^(1/2)*2i
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(x)}{a + b\cos(x) + c\cos^2(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Integral(sec(x)/(a + b*cos(x) + c*cos(x)**2), x)
```

3.19 $\int \frac{\sec^2(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=275

$$\frac{2bc\left(\frac{b^2-2ac}{b\sqrt{b^2-4ac}}+1\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{a^2\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2bc\left(1-\frac{b^2-2ac}{b\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{a^2\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}-\frac{b\tanh^{-1}(\mathrm{si}}{a^2}$$

```
[Out] -b*arctanh(sin(x))/a^2+2*b*c*arctan((b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/
2*x)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2))*(1+(-2*a*c+b^2)/b/(-4*a*c+b^2)^(1/2)
)/a^2/(b-2*c-(-4*a*c+b^2)^(1/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)+2*b
*c*arctan((b-2*c+(-4*a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a*c+b^2)^(
1/2))^(1/2))*(1+(2*a*c-b^2)/b/(-4*a*c+b^2)^(1/2))/a^2/(b-2*c+(-4*a*c+b^2)^(
1/2))^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2)+tan(x)/a
```

Rubi [A] time = 1.19, antiderivative size = 275, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {3257, 3293, 2659, 205, 3770, 3767, 8}

$$\frac{2bc\left(\frac{b^2-2ac}{b\sqrt{b^2-4ac}}+1\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{a^2\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2bc\left(1-\frac{b^2-2ac}{b\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{a^2\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}-\frac{b\tanh^{-1}(\mathrm{si}}{a^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[x]^2/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (2*b*c*(1 + (b^2 - 2*a*c)/(b*Sqrt[b^2 - 4*a*c]))*ArcTan[(Sqrt[b - 2*c - Sqr
t[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/(a^2*Sqrt[b -
 2*c - Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]) + (2*b*c*(1 -
(b^2 - 2*a*c)/(b*Sqrt[b^2 - 4*a*c]))*ArcTan[(Sqrt[b - 2*c + Sqrt[b^2 - 4*a*
c]]*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]])/(a^2*Sqrt[b - 2*c + Sqrt[
b^2 - 4*a*c]]*Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]) - (b*ArcTanh[Sin[x]])/a^2
+ Tan[x]/a
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3257

```
Int[cos[(d_.) + (e_.)*(x_)]^(m_.)*((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b
_.) + cos[(d_.) + (e_.)*(x_)]^(n2_.)*(c_.))^(p_), x_Symbol] :> Int[ExpandTr
ig[cos[d + e*x]^m*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n))^p, x], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && NeQ[b^2 - 4*a*c, 0] && Integ
ersQ[m, n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^2(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(\frac{b^2\left(1-\frac{ac}{b^2}\right)+bc\cos(x)}{a^2\left(a+b\cos(x)+c\cos^2(x)\right)} - \frac{b\sec(x)}{a^2} + \frac{\sec^2(x)}{a}\right) dx$$

$$= \frac{\int \frac{b^2\left(1-\frac{ac}{b^2}\right)+bc\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{a^2} + \frac{\int \sec^2(x)\,dx}{a} - \frac{b\int \sec(x)\,dx}{a^2}$$

$$= -\frac{b\tanh^{-1}(\sin(x))}{a^2} - \frac{\text{Subst}(\int 1\,dx, x, -\tan(x))}{a} + \frac{\left(c\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\right)\int \frac{1}{b+\sqrt{b^2-4a}}}{a^2}$$

$$= -\frac{b\tanh^{-1}(\sin(x))}{a^2} + \frac{\tan(x)}{a} + \frac{\left(2c\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\right)\text{Subst}\left(\int \frac{1}{b+2c+\sqrt{b^2-4ac}+\left(b-2c+\right.}\right.}{a^2}$$

$$= \frac{2c\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\,\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{a^2\sqrt{b-2c-\sqrt{b^2-4ac}}\,\sqrt{b+2c-\sqrt{b^2-4ac}}} + \frac{2c\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\tan^{-1}\left(\frac{\sqrt{b-2}}{\sqrt{}}\right.}{a^2\sqrt{b-2c+\sqrt{b^2-4ac}}\,\sqrt{b+}}$$

Mathematica [A] time = 1.18, size = 348, normalized size = 1.27

$$\frac{-\frac{\sqrt{2}c\left(b\sqrt{b^2-4ac}+2ac-b^2\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}+b-2c\right)}{\sqrt{-2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\sqrt{-b\sqrt{b^2-4ac}+2c(a+c)-b^2}} + \frac{\sqrt{2}c\left(b\sqrt{b^2-4ac}-2ac+b^2\right)\tanh^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\left(\sqrt{b^2-4ac}-b+2c\right)}{\sqrt{2b\sqrt{b^2-4ac}+4c(a+c)-2b^2}}\right)}{\sqrt{b^2-4ac}\sqrt{b\sqrt{b^2-4ac}+2c(a+c)-b^2}} + \frac{a\sin\left(\frac{x}{2}\right)}{\cos\left(\frac{x}{2}\right)-\sin\left(\frac{x}{2}\right)}}{a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[x]^2/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (-((Sqrt[2]*c*(-b^2 + 2*a*c + b*Sqrt[b^2 - 4*a*c])*ArcTanh[((b - 2*c + Sqrt
[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) - 2*b*Sqrt[b^2 - 4*a*c]]
])/(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a + c) - b*Sqrt[b^2 - 4*a*c]])) + (S
qrt[2]*c*(b^2 - 2*a*c + b*Sqrt[b^2 - 4*a*c])*ArcTanh[((-b + 2*c + Sqrt[b^2
- 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c]]])/(S
qrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c]]) + b*Log[Co
s[x/2] - Sin[x/2]] - b*Log[Cos[x/2] + Sin[x/2]] + (a*Sin[x/2])/(Cos[x/2] -
Sin[x/2]) + (a*Sin[x/2])/(Cos[x/2] + Sin[x/2]))/a^2
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.15, size = 2530, normalized size = 9.20

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(x)^2/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] -c/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/
2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))-c/(a-b+c)/(((-4*a*c+b^2)^(1/
2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*
(a-b+c))^(1/2))+2/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arct
an((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c*b^2-1/a^2
/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan
((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^4+1/a^2/(-4
*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-
a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^4+2/a/(-4*a*c
+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^3-1/a^2/(a-b+c)/(((
-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c
+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2*b-2/a/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4
*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b
^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^3-1/a/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a
-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(
1/2))*c^2+b/a^2*ln(tan(1/2*x)-1)-b/a^2*ln(tan(1/2*x)+1)+5/a/(-4*a*c+b^2)^(1
/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2*b-5/a/(-4*a*c+b^2)^(1/2
)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x
)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2*b-2/a/(-4*a*c+b^2)^(1/2)/(a
-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/
(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*b^2+2/a/(-4*a*c+b^2)^(1/2)/(a-b
```

```
+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-
4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c*b^2-2/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c
)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-
4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*b^3+2/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c
)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*
a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c*b^3+1/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/
(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*
a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2*b^2-1/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c
)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*
a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2*b^2-2/(-4*a*c+b^2)^(1/2)/(a-b+c)/((
(-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2+2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*
c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(
1/2)+a-c)*(a-b+c))^(1/2))*c^2-1/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+
c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1
/2))*b^3-1/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b
+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3+1/a/(a-b+c)/((
(-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+
b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^2-1/a/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(
a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c)
)^(1/2))*c^2-1/a/(tan(1/2*x)-1)-1/a/(tan(1/2*x)+1)+1/a/(-4*a*c+b^2)^(1/2)/(
a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(
((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*b^3+1/a/(a-b+c)/(((-4*a*c+b^2)^(1/
2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c
)*(a-b+c))^(1/2))*b^2-1/a/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a
+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a
-b+c))^(1/2))*b^3+3*c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*
(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c
))^(1/2))*b-3*c/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c
))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)
)*b+2/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*b^2-1/a^2/(a-b+c)/(
((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c
+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2*b
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)^2/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^2*cos(2*x)^2 + a^2*sin(2*x)^2 + 2*a^2*cos(2*x) + a^2)*integrate(2
*(2*b^2*c*cos(3*x)^2 + 2*b^2*c*cos(x)^2 + 2*b^2*c*sin(3*x)^2 + 2*b^2*c*sin(
x)^2 + b*c^2*cos(x) + 4*(2*a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*cos(2*x)^2 + 4*
```

```
(2*a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*sin(2*x)^2 + 2*(2*b^3 + b*c^2)*sin(2*x)
*sin(x) + (b*c^2*cos(3*x) + b*c^2*cos(x) + 2*(b^2*c - a*c^2)*cos(2*x))*cos(
4*x) + (4*b^2*c*cos(x) + b*c^2 + 2*(2*b^3 + b*c^2)*cos(2*x))*cos(3*x) + 2*(
b^2*c - a*c^2 + (2*b^3 + b*c^2)*cos(x))*cos(2*x) + (b*c^2*sin(3*x) + b*c^2*
sin(x) + 2*(b^2*c - a*c^2)*sin(2*x))*sin(4*x) + 2*(2*b^2*c*sin(x) + (2*b^3
+ b*c^2)*sin(2*x))*sin(3*x))/(a^2*c^2*cos(4*x)^2 + 4*a^2*b^2*cos(3*x)^2 + 4
*a^2*b^2*cos(x)^2 + a^2*c^2*sin(4*x)^2 + 4*a^2*b^2*sin(3*x)^2 + 4*a^2*b^2*s
in(x)^2 + 4*a^2*b*c*cos(x) + a^2*c^2 + 4*(4*a^4 + 4*a^3*c + a^2*c^2)*cos(2*
x)^2 + 4*(4*a^4 + 4*a^3*c + a^2*c^2)*sin(2*x)^2 + 8*(2*a^3*b + a^2*b*c)*sin
(2*x)*sin(x) + 2*(2*a^2*b*c*cos(3*x) + 2*a^2*b*c*cos(x) + a^2*c^2 + 2*(2*a^
3*c + a^2*c^2)*cos(2*x))*cos(4*x) + 4*(2*a^2*b^2*cos(x) + a^2*b*c + 2*(2*a^
3*b + a^2*b*c)*cos(2*x))*cos(3*x) + 4*(2*a^3*c + a^2*c^2 + 2*(2*a^3*b + a^2
*b*c)*cos(x))*cos(2*x) + 4*(a^2*b*c*sin(3*x) + a^2*b*c*sin(x) + (2*a^3*c +
a^2*c^2)*sin(2*x))*sin(4*x) + 8*(a^2*b^2*sin(x) + (2*a^3*b + a^2*b*c)*sin(2
*x))*sin(3*x)), x) - (b*cos(2*x)^2 + b*sin(2*x)^2 + 2*b*cos(2*x) + b)*log(c
os(x)^2 + sin(x)^2 + 2*sin(x) + 1) + (b*cos(2*x)^2 + b*sin(2*x)^2 + 2*b*cos
(2*x) + b)*log(cos(x)^2 + sin(x)^2 - 2*sin(x) + 1) + 4*a*sin(2*x))/(a^2*cos
(2*x)^2 + a^2*sin(2*x)^2 + 2*a^2*cos(2*x) + a^2)
```

mupad [B] time = 13.18, size = 29417, normalized size = 106.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(x)^2*(a + b*cos(x) + c*cos(x)^2)),x)
```

```
[Out] (b*atan(((b*((8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^
4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 -
35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a
^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c
^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4 + (b*
((8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 -
 a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c
^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c
 - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^
3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^
4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^
6*b^2*c^2 + 5*a*b^8*c))/a^4 + (b*((b*((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*
b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^8*c^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^
6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c + 28*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c
^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 + 5*a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*
c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4 - 3*a^6*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^
7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8*b^2*c^2))/a^4 + (8192*b*tan(x/2)*(8*a^12
*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8*a^9*b^4 + 6*a^10*b^3 - 2*a^11*b^
2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3 - 16*a^11*c^2 - 2*a^6*b^6*c - 14*
```

```
a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8*b^4*c + 88*a^9*b*c^3 - 50*a^9*b^3*c + 72*a
^10*b*c^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3 - 2*a^6*b^5*c^2 - 14*a^7*b^2*c^4
+ 10*a^7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^8*b^2*c^3 + 2*a^8*b^3*c^2 - 80*a^9
*b^2*c^2 - 24*a^11*b*c))/a^6))/a^2 + (8192*tan(x/2)*(6*a^3*b^8 - 2*a^2*b^9
- 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 10*a^5*c^6 + 6*a^6*c^5 -
2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c - 50*a^4*b^6*c - 22*a^5*
b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c + 18*a^7*b*c^3 + 24*a^7*
b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 14*a^3*b^4*c^4 - 10*a
^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 59*a^4*b^4*
c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*c^3 + 93*a^5*b^4*c^2 + 3
7*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a^4))/a^2))/a^2)*1i)/a^2
+ (b*((8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 -
 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^
4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*
c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18
*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4 - (b*((8192*
(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^
4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38
*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a
^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c
^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*
a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c
^2 + 5*a*b^8*c))/a^4 + (b*((b*((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a
^8*b^4 + 12*a^7*c^5 + 20*a^8*c^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8
*a^6*b*c^5 - 15*a^6*b^5*c + 28*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31
*a^8*b^3*c + 44*a^9*b*c^2 + 5*a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a
^5*b^5*c^2 - 23*a^6*b^2*c^4 - 3*a^6*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c
^3 - 4*a^7*b^3*c^2 - 73*a^8*b^2*c^2))/a^4 - (8192*b*tan(x/2)*(8*a^12*c + 2*
a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8*a^9*b^4 + 6*a^10*b^3 - 2*a^11*b^2 + 24*
a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3 - 16*a^11*c^2 - 2*a^6*b^6*c - 14*a^7*b^5
*c - 8*a^8*b*c^4 + 46*a^8*b^4*c + 88*a^9*b*c^3 - 50*a^9*b^3*c + 72*a^10*b*c
^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3 - 2*a^6*b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^
7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^8*b^2*c^3 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^
2 - 24*a^11*b*c))/a^6))/a^2 - (8192*tan(x/2)*(6*a^3*b^8 - 2*a^2*b^9 - 8*a^4
*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 10*a^5*c^6 + 6*a^6*c^5 - 2*a^7*c
^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c - 50*a^4*b^6*c - 22*a^5*b*c^5 +
 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c + 18*a^7*b*c^3 + 24*a^7*b^3*c -
 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 14*a^3*b^4*c^4 - 10*a^3*b^5*
c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 59*a^4*b^4*c^3 + 7
*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*c^3 + 93*a^5*b^4*c^2 + 37*a^6*b
^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a^4))/a^2))/a^2)*1i)/a^2)/((1638
4*(b*c^7 - 4*b^2*c^6 + 6*b^3*c^5 - 4*b^4*c^4 + b^5*c^3 - 2*a*b^2*c^5 + 2*a*
b^3*c^4 - a*b^4*c^3 + a^2*b^2*c^4 + a*b*c^6))/a^4 + (b*((8192*tan(x/2)*(a*b
^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 -
 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20
```

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*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*
a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*
c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4 + (b*((8192*(6*a^2*b^8 - 3*a*b^9 - 4*
a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6
*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*b*c^5
 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*b^4*c
^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*
a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*
c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c))/a^4 + (b
*((b*((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*
a^8*c^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c
 + 28*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2
 + 5*a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c
^4 - 3*a^6*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a
^8*b^2*c^2))/a^4 + (8192*b*tan(x/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a
^8*b^5 - 8*a^9*b^4 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32
*a^10*c^3 - 16*a^11*c^2 - 2*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8
*b^4*c + 88*a^9*b*c^3 - 50*a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^
6*b^4*c^3 - 2*a^6*b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^
2 - 68*a^8*b^2*c^3 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^6))/a
^2 + (8192*tan(x/2)*(6*a^3*b^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*
b^5 + 2*a^7*b^4 + 10*a^5*c^6 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^
8*c + 14*a^3*b^7*c - 50*a^4*b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*
c^4 - 38*a^6*b^4*c + 18*a^7*b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*
c^3 + 2*a^2*b^7*c^2 + 14*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27
*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2
*c^4 - 122*a^5*b^3*c^3 + 93*a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 +
 23*a^7*b^2*c^2))/a^4))/a^2))/a^2))/a^2 - (b*((8192*tan(x/2)*(a*b^8 + 5*b^8
*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^
2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2
 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^
3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^
4*b^2*c^3 + 2*a*b^7*c))/a^4 - (b*((8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 +
a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b
^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*
b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2
*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^
3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^
5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c))/a^4 + (b*((b*((819
2*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^8*c^4 +
4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c + 28*a^7*
b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 + 5*a^9*b
^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4 - 3*a^6
*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8*b^2*c^2
))/a^4 - (8192*b*tan(x/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8
```

*a^9*b^4 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3
- 16*a^11*c^2 - 2*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8*b^4*c + 8
8*a^9*b*c^3 - 50*a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3
- 2*a^6*b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^8
*b^2*c^3 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^6))/a^2 - (8192
tan(x/2)(6*a^3*b^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^
7*b^4 + 10*a^5*c^6 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a
^3*b^7*c - 50*a^4*b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a
^6*b^4*c + 18*a^7*b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^
2*b^7*c^2 + 14*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c
^5 + 15*a^4*b^3*c^4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122
*a^5*b^3*c^3 + 93*a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^
2*c^2))/a^4))/a^2))/a^2))/a^2))*2i)/a^2 - atan(((((((8192*(3*a^5*b^7 - 7*a^
6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^8*c^4 + 4*a^9*c^3 - 4*a^10*
c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c + 28*a^7*b*c^4 + 46*a^7*b^4*
c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 + 5*a^9*b^2*c - 2*a^5*b^3*c^
4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4 - 3*a^6*b^3*c^3 + 40*a^6*b
^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8*b^2*c^2))/a^4 - (8192*tan(
x/2)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^
2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^
2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1
/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/
2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b
^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)*
(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8*a^9*b^4 + 6*a^10*b^3 - 2*
a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3 - 16*a^11*c^2 - 2*a^6*b^6*
c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8*b^4*c + 88*a^9*b*c^3 - 50*a^9*b^3*c
+ 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3 - 2*a^6*b^5*c^2 - 14*a^7*b
^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^8*b^2*c^3 + 2*a^8*b^3*c^2 -
80*a^9*b^2*c^2 - 24*a^11*b*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(
-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b
^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3
*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) +
4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32
*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^
2*c^3 - 32*a^6*b^2*c^2)))^(1/2) - (8192*tan(x/2)*(6*a^3*b^8 - 2*a^2*b^9 - 8
*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 10*a^5*c^6 + 6*a^6*c^5 - 2*a
^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c - 50*a^4*b^6*c - 22*a^5*b*c
^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c + 18*a^7*b*c^3 + 24*a^7*b^3
*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 14*a^3*b^4*c^4 - 10*a^3*
b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 59*a^4*b^4*c^3
+ 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*c^3 + 93*a^5*b^4*c^2 + 37*a
^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*
a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2
*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) -

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 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b
^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 +
16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4
*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*(6*a^2*b^8 - 3*a*b^9
 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*
a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*
b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*
b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4
+ 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4
*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c))/a^4
)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 +
 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(
-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2)
 - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))
/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*
c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) - (
8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*
c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 +
 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 2
0*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^
3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4)*(-(b^8 + 8*a^3*c^5
 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^
2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1
/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*
c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b
^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^
4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)*1i - (((((8192*(3*a^5*b
^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^8*c^4 + 4*a^9*c^3
- 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c + 28*a^7*b*c^4 + 46
*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 + 5*a^9*b^2*c - 2*a
^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4 - 3*a^6*b^3*c^3 +
 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8*b^2*c^2))/a^4 + (
8192*tan(x/2)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2)
 - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3
 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b
^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^
2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 +
 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)
))^(1/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8*a^9*b^4 + 6*a^10
*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3 - 16*a^11*c^2 - 2
*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8*b^4*c + 88*a^9*b*c^3 - 50*
a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3 - 2*a^6*b^5*c^2 -
 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^8*b^2*c^3 + 2*a^8*
b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^
4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 +
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33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*tan(x/2)*(6*a^3*b^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 10*a^5*c^6 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c - 50*a^4*b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c + 18*a^7*b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 14*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*c^3 + 93*a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)*1i)/((((((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^8*c^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c + 28*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 + 5*a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4 - 3*a^6*

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b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8*b^2*c^2)
)/a^4 - (8192*tan(x/2)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)
^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^
3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(
4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4
*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*
a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6
*b^2*c^2)))^(1/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8*a^9*b^4
 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3 - 16*a^1
1*c^2 - 2*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8*b^4*c + 88*a^9*b*
c^3 - 50*a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3 - 2*a^6*
b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^8*b^2*c^3
 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^4)*(-(b^8 + 8*a^3*c^5 +
 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*
b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2
) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c
- b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6
 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*
b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) - (8192*tan(x/2)*(6*a^3*b
^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 10*a^5*c^6
 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c - 50*a^4*
b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c + 18*a^7*
b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 14*a^3
*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a^4*b^3*c^
4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*c^3 + 93*
a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a^4)*(-(b^
8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^
4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c
 - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*
b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^
6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a
^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*(6
*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4
+ 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a
^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2
*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5
 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^
4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2
 + 5*a*b^8*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)
^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b
^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a
*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*
c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8
*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^
2*c^2)))^(1/2) - (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6
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+ b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^
5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c +
10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b
^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4)*
(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8
*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(
4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) -
 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(
2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c
- 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (((
((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^8*c
^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c + 28
*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 + 5*
a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4 -
3*a^6*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8*b^
2*c^2))/a^4 + (8192*tan(x/2)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c
- b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 -
 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c
^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*
c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3
 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 -
32*a^6*b^2*c^2)))^(1/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8*a
^9*b^4 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3 -
16*a^11*c^2 - 2*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8*b^4*c + 88*
a^9*b*c^3 - 50*a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3 -
2*a^6*b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^8*b
^2*c^3 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^4)*(-(b^8 + 8*a^3
*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 1
8*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3
)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(
4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a
^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c
+ a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*tan(x/2)*(6
*a^3*b^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 10*a
^5*c^6 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c - 5
0*a^4*b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c + 1
8*a^7*b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2 +
14*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a^4*
b^3*c^4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*c^3
 + 93*a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a^4)
*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 +
8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-
(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2)
- 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/
(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c
```

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 - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8
192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^
6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6
- 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c -
10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b
^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 -
 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b
^2*c^2 + 5*a*b^8*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b
^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38
*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*
(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(
-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 +
16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*
a^6*b^2*c^2)))^(1/2) + (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^
3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*
b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^
6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10
*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))
/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c
^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c
^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(
1/2) - 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1
/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*
b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)
 + (16384*(b*c^7 - 4*b^2*c^6 + 6*b^3*c^5 - 4*b^4*c^4 + b^5*c^3 - 2*a*b^2*c^
5 + 2*a*b^3*c^4 - a*b^4*c^3 + a^2*b^2*c^4 + a*b*c^6))/a^4))*(-(b^8 + 8*a^3*
c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18
*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)
^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 2*a*b*c^3*(-(4
*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^
4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c +
 a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)*2i - atan((((((8192
*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^8*c^4 + 4
*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c + 28*a^7*b
*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 + 5*a^9*b^
2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4 - 3*a^6*
b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8*b^2*c^2)
)/a^4 - (8192*tan(x/2)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)
^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^
3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(
4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4
*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*
a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6
*b^2*c^2)))^(1/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8*a^9*b^4
 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3 - 16*a^1
```

1*c^2 - 2*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8*b^4*c + 88*a^9*b*
c^3 - 50*a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3 - 2*a^6*
b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^8*b^2*c^3
 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^4)*(-(b^8 + 8*a^3*c^5 +
 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*
b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2
) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c
- b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6
 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*
b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) - (8192*tan(x/2)*(6*a^3*b
^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 10*a^5*c^6
 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c - 50*a^4*
b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c + 18*a^7*
b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 14*a^3
*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a^4*b^3*c^
4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*c^3 + 93*
a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a^4)*(-(b^
8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^
4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c
 - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*
b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^
6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a
^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*(6
*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4
+ 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a
^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2
*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5
 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^
4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2
 + 5*a*b^8*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)
^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b
^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a
*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*
c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8
*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^
2*c^2)))^(1/2) - (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6
+ b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^
5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c +
10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b
^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4)*
(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8
*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(
4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) +
 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(
2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c

```
- 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)*1i -
(((((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^
8*c^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c +
 28*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 +
 5*a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4
 - 3*a^6*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8
*b^2*c^2))/a^4 + (8192*tan(x/2)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a
*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^
2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*
b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b
^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*
c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3
 - 32*a^6*b^2*c^2)))^(1/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 -
8*a^9*b^4 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3
 - 16*a^11*c^2 - 2*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8*b^4*c +
88*a^9*b*c^3 - 50*a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^6*b^4*c^3
 - 2*a^6*b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^2 - 68*a^
8*b^2*c^3 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^4)*(-(b^8 + 8*
a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3
- 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2
)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*
(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4
- a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2
*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*tan(x/2)
*(6*a^3*b^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 1
0*a^5*c^6 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c
- 50*a^4*b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c
+ 18*a^7*b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2
 + 14*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a
^4*b^3*c^4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*
c^3 + 93*a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a
^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2
 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2
*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/
2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2
))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^
4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) +
 (8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 -
 a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c
^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c
 - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^
3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^
4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^
6*b^2*c^2 + 5*a*b^8*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c
- b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 -
```

38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c
^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*
c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3
+ 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 -
32*a^6*b^2*c^2)))^(1/2) + (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 +
a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14
*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2
*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 +
10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*
c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^
6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^
3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3
)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)
^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a
^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1
/2)*1i)/((((((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^
5 + 20*a^8*c^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^
6*b^5*c + 28*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^
9*b*c^2 + 5*a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^
6*b^2*c^4 - 3*a^6*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2
- 73*a^8*b^2*c^2))/a^4 - (8192*tan(x/2)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b
^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a
^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c
+ 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2
) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4
+ 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^
5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a
^8*b^5 - 8*a^9*b^4 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32
*a^10*c^3 - 16*a^11*c^2 - 2*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 + 46*a^8
*b^4*c + 88*a^9*b*c^3 - 50*a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c + 2*a^
6*b^4*c^3 - 2*a^6*b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*b^4*c^
2 - 68*a^8*b^2*c^3 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^4)*(-
(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a
*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*
a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2
*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*
(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c -
8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) - (8192
tan(x/2)(6*a^3*b^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^
7*b^4 + 10*a^5*c^6 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a
^3*b^7*c - 50*a^4*b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a
^6*b^4*c + 18*a^7*b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^
2*b^7*c^2 + 14*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c
^5 + 15*a^4*b^3*c^4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122
*a^5*b^3*c^3 + 93*a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^

2*c^2))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2)
- b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3
- b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^
2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2
)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 +
10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2))
)^(1/2) + (8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*
a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c +
8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*
a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^
2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a
^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c
^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*
(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*
b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c +
3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) -
4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 3
2*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b
^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) - (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 +
a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2
*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^
6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*
b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 +
2*a*b^7*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(
1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2
*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c
- b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c
- b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c
^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*
c^2)))^(1/2) + (((((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*
a^7*c^5 + 20*a^8*c^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 -
15*a^6*b^5*c + 28*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c +
44*a^9*b*c^2 + 5*a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 -
23*a^6*b^2*c^4 - 3*a^6*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b
^3*c^2 - 73*a^8*b^2*c^2))/a^4 + (8192*tan(x/2)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c
^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4
+ 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a
*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3
)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^
6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2
- 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6
+ 8*a^8*b^5 - 8*a^9*b^4 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^
4 - 32*a^10*c^3 - 16*a^11*c^2 - 2*a^6*b^6*c - 14*a^7*b^5*c - 8*a^8*b*c^4 +
46*a^8*b^4*c + 88*a^9*b*c^3 - 50*a^9*b^3*c + 72*a^10*b*c^2 + 36*a^10*b^2*c
+ 2*a^6*b^4*c^3 - 2*a^6*b^5*c^2 - 14*a^7*b^2*c^4 + 10*a^7*b^3*c^3 + 24*a^7*

b^4*c^2 - 68*a^8*b^2*c^3 + 2*a^8*b^3*c^2 - 80*a^9*b^2*c^2 - 24*a^11*b*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*tan(x/2)*(6*a^3*b^8 - 2*a^2*b^9 - 8*a^4*b^7 + 8*a^5*b^6 - 6*a^6*b^5 + 2*a^7*b^4 + 10*a^5*c^6 + 6*a^6*c^5 - 2*a^7*c^4 + 2*a^8*c^3 + 2*a^2*b^8*c + 14*a^3*b^7*c - 50*a^4*b^6*c - 22*a^5*b*c^5 + 56*a^5*b^5*c + 12*a^6*b*c^4 - 38*a^6*b^4*c + 18*a^7*b*c^3 + 24*a^7*b^3*c - 8*a^8*b^2*c - 2*a^2*b^6*c^3 + 2*a^2*b^7*c^2 + 14*a^3*b^4*c^4 - 10*a^3*b^5*c^3 - 24*a^3*b^6*c^2 - 27*a^4*b^2*c^5 + 15*a^4*b^3*c^4 + 59*a^4*b^4*c^3 + 7*a^4*b^5*c^2 + 11*a^5*b^2*c^4 - 122*a^5*b^3*c^3 + 93*a^5*b^4*c^2 + 37*a^6*b^2*c^3 - 99*a^6*b^3*c^2 + 23*a^7*b^2*c^2))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2) + (16384*(b*c^7 - 4*b^2*c^6 + 6*b^3*c^5 - 4*b^4*c^4 + b^5*c^3 - 2*a*b^2*c^5 + 2*a*b^3*c^4 - a*b^4*c^3 + a^2*b^2*c^4 + a*b*c^6))/a^4

```
))*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - b^6*c^2
+ 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*
(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2
) + 2*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2)
)/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4
*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)))^(1/2)*2i
 - (2*tan(x/2))/(a*(tan(x/2)^2 - 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^2(x)}{a + b\cos(x) + c\cos^2(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)**2/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Integral(sec(x)**2/(a + b*cos(x) + c*cos(x)**2), x)
```

3.20 $\int \frac{\sec^3(x)}{a+b\cos(x)+c\cos^2(x)}\,dx$

Optimal. Leaf size=334

$$\frac{(b^2-ac)\tanh^{-1}(\sin(x))}{a^3}-\frac{2c\left(\sqrt{b^2-4ac}\,(b^2-ac)-3abc+b^3\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{a^3\sqrt{b^2-4ac}\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2c\left(-\sqrt{b^2-4ac}\right.}{a^3\sqrt{b^2-4a}}$$

```
[Out] 1/2*arctanh(sin(x))/a+(-a*c+b^2)*arctanh(sin(x))/a^3-2*c*arctan((b-2*c-(-4*
a*c+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2))*(b^3-3*a
*b*c+(-a*c+b^2)*(-4*a*c+b^2)^(1/2))/a^3/(-4*a*c+b^2)^(1/2)/(b-2*c-(-4*a*c+b
^2)^(1/2))^(1/2)/(b+2*c-(-4*a*c+b^2)^(1/2))^(1/2)+2*c*arctan((b-2*c+(-4*a*c
+b^2)^(1/2))^(1/2)*tan(1/2*x)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2))*(b^3-3*a*b*
c-(-a*c+b^2)*(-4*a*c+b^2)^(1/2))/a^3/(-4*a*c+b^2)^(1/2)/(b-2*c+(-4*a*c+b^2)
^(1/2))^(1/2)/(b+2*c+(-4*a*c+b^2)^(1/2))^(1/2)-b*tan(x)/a^2+1/2*sec(x)*tan(
x)/a
```

Rubi [A] time = 4.67, antiderivative size = 334, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.421, Rules used = {3257, 3293, 2659, 205, 3770, 3767, 8, 3768}

$$-\frac{2c\left(\sqrt{b^2-4ac}\,(b^2-ac)-3abc+b^3\right)\tan^{-1}\left(\frac{\tan\left(\frac{x}{2}\right)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{a^3\sqrt{b^2-4ac}\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}}+\frac{2c\left(-\sqrt{b^2-4ac}\,(b^2-ac)-3abc+b^3\right)\tan}{a^3\sqrt{b^2-4ac}\sqrt{\sqrt{b^2-4ac}+b-2c}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[x]^3/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] (-2*c*(b^3 - 3*a*b*c + Sqrt[b^2 - 4*a*c]*(b^2 - a*c))*ArcTan[(Sqrt[b - 2*c
- Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c - Sqrt[b^2 - 4*a*c]]])/(a^3*Sqr
t[b^2 - 4*a*c]*Sqrt[b - 2*c - Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c - Sqrt[b^2 -
4*a*c]]) + (2*c*(b^3 - 3*a*b*c - Sqrt[b^2 - 4*a*c]*(b^2 - a*c))*ArcTan[(Sqr
t[b - 2*c + Sqrt[b^2 - 4*a*c]]*Tan[x/2])/Sqrt[b + 2*c + Sqrt[b^2 - 4*a*c]]]
)/(a^3*Sqrt[b^2 - 4*a*c]*Sqrt[b - 2*c + Sqrt[b^2 - 4*a*c]]*Sqrt[b + 2*c + S
qrt[b^2 - 4*a*c]]) + ArcTanh[Sin[x]]/(2*a) + ((b^2 - a*c)*ArcTanh[Sin[x]])/
a^3 - (b*Tan[x])/a^2 + (Sec[x]*Tan[x])/(2*a)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2659

```
Int[((a_) + (b_.)*sin[Pi/2 + (c_.) + (d_.)*(x_)])^(-1), x_Symbol] :> With[{
e = FreeFactors[Tan[(c + d*x)/2], x]}, Dist[(2*e)/d, Subst[Int[1/(a + b + (
a - b)*e^2*x^2), x], x, Tan[(c + d*x)/2]/e], x]] /; FreeQ[{a, b, c, d}, x]
&& NeQ[a^2 - b^2, 0]
```

Rule 3257

```
Int[cos[(d_.) + (e_.)*(x_)]^(m_.)*((a_.) + cos[(d_.) + (e_.)*(x_)]^(n_.)*(b
_.) + cos[(d_.) + (e_.)*(x_)]^(n2_.)*(c_.))^(p_), x_Symbol] :> Int[ExpandTr
ig[cos[d + e*x]^m*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n))^p, x], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && NeQ[b^2 - 4*a*c, 0] && Integ
ersQ[m, n, p]
```

Rule 3293

```
Int[(cos[(d_.) + (e_.)*(x_)]*(B_.) + (A_))/((a_.) + cos[(d_.) + (e_.)*(x_)]
*(b_.) + cos[(d_.) + (e_.)*(x_)]^2*(c_.)), x_Symbol] :> Module[{q = Rt[b^2
- 4*a*c, 2]}, Dist[B + (b*B - 2*A*c)/q, Int[1/(b + q + 2*c*Cos[d + e*x]), x
], x] + Dist[B - (b*B - 2*A*c)/q, Int[1/(b - q + 2*c*Cos[d + e*x]), x], x]]
 /; FreeQ[{a, b, c, d, e, A, B}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^3(x)}{a+b\cos(x)+c\cos^2(x)}\,dx = \int \left(\frac{-b^3\left(1-\frac{2ac}{b^2}\right)-b^2c\left(1-\frac{ac}{b^2}\right)\cos(x)}{a^3\left(a+b\cos(x)+c\cos^2(x)\right)}+\frac{\left(b^2-ac\right)\sec(x)}{a^3}-\frac{b\sec^2(x)}{a^2}+\frac{\sec^3(x}{a}$$

$$=\frac{\int\frac{-b^3\left(1-\frac{2ac}{b^2}\right)-b^2c\left(1-\frac{ac}{b^2}\right)\cos(x)}{a+b\cos(x)+c\cos^2(x)}\,dx}{a^3}+\frac{\int\sec^3(x)\,dx}{a}-\frac{b\int\sec^2(x)\,dx}{a^2}+\frac{\left(b^2-ac\right)\int se}{a^3}$$

$$=\frac{\left(b^2-ac\right)\tanh^{-1}(\sin(x))}{a^3}+\frac{\sec(x)\tan(x)}{2a}+\frac{\int\sec(x)\,dx}{2a}+\frac{b\,\mathrm{Subst}(\int 1\,dx,x,-}{a^2}$$

$$=\frac{\tanh^{-1}(\sin(x))}{2a}+\frac{\left(b^2-ac\right)\tanh^{-1}(\sin(x))}{a^3}-\frac{b\tan(x)}{a^2}+\frac{\sec(x)\tan(x)}{2a}+\frac{\left(2c\right(}{}$$

$$=-\frac{2c\left(b^3-3abc+\sqrt{b^2-4ac}\left(b^2-ac\right)\right)\tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}}\tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{a^3\sqrt{b^2-4ac}\sqrt{b-2c-\sqrt{b^2-4ac}}\sqrt{b+2c-\sqrt{b^2-4ac}}}+\frac{2c\left(b^3-\right.}{a^3\sqrt{}}$$

Mathematica [A] time = 3.07, size = 446, normalized size = 1.34

$$-\frac{2\left(a^2-2ac+2b^2\right)\log\left(\cos\left(\frac{x}{2}\right)-\sin\left(\frac{x}{2}\right)\right)-2\left(a^2-2ac+2b^2\right)\log\left(\sin\left(\frac{x}{2}\right)+\cos\left(\frac{x}{2}\right)\right)+\frac{a^2}{\sin(x)-1}+\frac{a^2}{\left(\sin\left(\frac{x}{2}\right)+\cos\left(\frac{x}{2}\right.\right.}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[x]^3/(a + b*Cos[x] + c*Cos[x]^2),x]
```

```
[Out] -1/4*((4*Sqrt[2]*c*(b^3 - 3*a*b*c - b^2*Sqrt[b^2 - 4*a*c] + a*c*Sqrt[b^2 -
4*a*c])*ArcTanh[((b - 2*c + Sqrt[b^2 - 4*a*c])*Tan[x/2])/Sqrt[-2*b^2 + 4*c*
(a + c) - 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*c]*Sqrt[-b^2 + 2*c*(a +
c) - b*Sqrt[b^2 - 4*a*c]]) + (4*Sqrt[2]*c*(b^3 - 3*a*b*c + b^2*Sqrt[b^2 - 4
*a*c] - a*c*Sqrt[b^2 - 4*a*c])*ArcTanh[((-b + 2*c + Sqrt[b^2 - 4*a*c])*Tan[
x/2])/Sqrt[-2*b^2 + 4*c*(a + c) + 2*b*Sqrt[b^2 - 4*a*c]]])/(Sqrt[b^2 - 4*a*
c]*Sqrt[-b^2 + 2*c*(a + c) + b*Sqrt[b^2 - 4*a*c]]) + 2*(a^2 + 2*b^2 - 2*a*c
```

```
)*Log[Cos[x/2] - Sin[x/2]] - 2*(a^2 + 2*b^2 - 2*a*c)*Log[Cos[x/2] + Sin[x/2
]] + (4*a*b*Sin[x/2])/(Cos[x/2] - Sin[x/2]) + a^2/(Cos[x/2] + Sin[x/2])^2 +
 (4*a*b*Sin[x/2])/(Cos[x/2] + Sin[x/2]) + a^2/(-1 + Sin[x]))/a^3
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.16, size = 3476, normalized size = 10.41

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(x)^3/(a+b*cos(x)+c*cos(x)^2),x)
```

```
[Out] 1/a^3/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1
/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2*b^2-2/a^3/(a-b+c)/(((-4
*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2
)^(1/2)+a-c)*(a-b+c))^(1/2))*c*b^3+1/a^3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a
*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^
(1/2)+a-c)*(a-b+c))^(1/2))*b^5+1/a^3/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b
+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(
1/2))*c^2*b^2-2/a^3/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctan
h((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c*b^3-1/a^3
/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctan
h((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^5+1/a^2/(
tan(1/2*x)-1)*b+1/a^2*ln(tan(1/2*x)-1)*c-1/a^3*ln(tan(1/2*x)-1)*b^2+1/a^2/(
tan(1/2*x)+1)*b-1/a^2*ln(tan(1/2*x)+1)*c+1/a^3*ln(tan(1/2*x)+1)*b^2+1/2/a/(
tan(1/2*x)-1)^2-1/2/a/(tan(1/2*x)+1)^2-1/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a
-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b
```

```
+c))^(1/2))*c*b^2-1/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c
)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c
))^(1/2))*b^4+1/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a
-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))
^(1/2))*b^4-2/a/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c
))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)
)*c^3+3/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-
c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2*b+2/a/(-4*a*c+b
^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)
*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^3-1/a/(a-b+c)/(((-4
*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2
)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2+1/a/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b
^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1
/2)-a+c)*(a-b+c))^(1/2))*c^2*b-1/a/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2
)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+
a-c)*(a-b+c))^(1/2))*c^2*b-4/a/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1
/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+
c)*(a-b+c))^(1/2))*c*b^2+4/a/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2
)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(
a-b+c))^(1/2))*c*b^2-2/a^3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+
a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-
b+c))^(1/2))*c*b^4+3/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+
c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-
b+c))^(1/2))*b*c^3-3/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-
c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+
c))^(1/2))*b*c^3+2/a^3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)
*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+
c))^(1/2))*c*b^4+1/a^3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)
*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c)
)^(1/2))*c^2*b^3-1/a^3/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)
*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+
c))^(1/2))*c^2*b^3+3/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+
c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-
b+c))^(1/2))*c*b^3-3/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-
c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+
c))^(1/2))*c*b^3-7/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)
*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+
c))^(1/2))*c^2*b^2+7/a^2/(-4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-
c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+
c))^(1/2))*c^2*b^2-1/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*a
rctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^3+2/(-
4*a*c+b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((
-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2-2/(-4*a*c+
b^2)^(1/2)/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*
tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2-1/a^2/(a-b+c)/(((-
```

```
4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+
b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^3-1/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)
*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c)
)^(1/2))*b^3-1/2/a*ln(tan(1/2*x)-1)+1/2/a*ln(tan(1/2*x)+1)+1/a^3/(a-b+c)/((
(-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*
c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*b^4+1/a^3/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-
c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+
c))^(1/2))*b^4-1/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arcta
nh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^3-1/a/(a
-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/
(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c^2+1/2/a/(tan(1/2*x)-1)+1/2/a/(t
an(1/2*x)+1)+2/a*b/(a-b+c)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2)*arctanh
((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(a-b+c))^(1/2))*c+2/a*b/(a-b
+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)*arctan((a-b+c)*tan(1/2*x)/(((-
4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c-1/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)-
a+c)*(a-b+c))^(1/2)*arctanh((-a+b-c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)-a+c)*(
a-b+c))^(1/2))*c*b^2+3/a^2/(a-b+c)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2)
*arctan((a-b+c)*tan(1/2*x)/(((-4*a*c+b^2)^(1/2)+a-c)*(a-b+c))^(1/2))*c^2*b
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)^3/(a+b*cos(x)+c*cos(x)^2),x, algorithm="maxima")
```

```
[Out] -1/4*(8*a^2*cos(3*x)*sin(2*x) + 8*a^2*cos(2*x)*sin(x) + 4*a^2*sin(x) - 4*(a
^2*sin(3*x) + 2*a*b*sin(2*x) - a^2*sin(x))*cos(4*x) - 4*(a^3*cos(4*x)^2 + 4
*a^3*cos(2*x)^2 + a^3*sin(4*x)^2 + 4*a^3*sin(4*x)*sin(2*x) + 4*a^3*sin(2*x)
^2 + 4*a^3*cos(2*x) + a^3 + 2*(2*a^3*cos(2*x) + a^3)*cos(4*x))*integrate(-2
*(2*(b^3*c - a*b*c^2)*cos(3*x)^2 + 4*(2*a*b^3 - 2*a*b*c^2 - (4*a^2*b - b^3)
*c)*cos(2*x)^2 + 2*(b^3*c - a*b*c^2)*cos(x)^2 + 2*(b^3*c - a*b*c^2)*sin(3*x
)^2 + 4*(2*a*b^3 - 2*a*b*c^2 - (4*a^2*b - b^3)*c)*sin(2*x)^2 + 2*(2*b^4 - 2
*a*b^2*c - a*c^3 - (2*a^2 - b^2)*c^2)*sin(2*x)*sin(x) + 2*(b^3*c - a*b*c^2)
*sin(x)^2 + ((b^2*c^2 - a*c^3)*cos(3*x) + 2*(b^3*c - 2*a*b*c^2)*cos(2*x) +
(b^2*c^2 - a*c^3)*cos(x))*cos(4*x) + (b^2*c^2 - a*c^3 + 2*(2*b^4 - 2*a*b^2*
c - a*c^3 - (2*a^2 - b^2)*c^2)*cos(2*x) + 4*(b^3*c - a*b*c^2)*cos(x))*cos(3
*x) + 2*(b^3*c - 2*a*b*c^2 + (2*b^4 - 2*a*b^2*c - a*c^3 - (2*a^2 - b^2)*c^2
)*cos(x))*cos(2*x) + (b^2*c^2 - a*c^3)*cos(x) + ((b^2*c^2 - a*c^3)*sin(3*x)
 + 2*(b^3*c - 2*a*b*c^2)*sin(2*x) + (b^2*c^2 - a*c^3)*sin(x))*sin(4*x) + 2*
((2*b^4 - 2*a*b^2*c - a*c^3 - (2*a^2 - b^2)*c^2)*sin(2*x) + 2*(b^3*c - a*b*
c^2)*sin(x))*sin(3*x))/(a^3*c^2*cos(4*x)^2 + 4*a^3*b^2*cos(3*x)^2 + 4*a^3*b
^2*cos(x)^2 + a^3*c^2*sin(4*x)^2 + 4*a^3*b^2*sin(3*x)^2 + 4*a^3*b^2*sin(x)^
2 + 4*a^3*b*c*cos(x) + a^3*c^2 + 4*(4*a^5 + 4*a^4*c + a^3*c^2)*cos(2*x)^2 +
 4*(4*a^5 + 4*a^4*c + a^3*c^2)*sin(2*x)^2 + 8*(2*a^4*b + a^3*b*c)*sin(2*x)*
```

```
sin(x) + 2*(2*a^3*b*c*cos(3*x) + 2*a^3*b*c*cos(x) + a^3*c^2 + 2*(2*a^4*c +
a^3*c^2)*cos(2*x))*cos(4*x) + 4*(2*a^3*b^2*cos(x) + a^3*b*c + 2*(2*a^4*b +
a^3*b*c)*cos(2*x))*cos(3*x) + 4*(2*a^4*c + a^3*c^2 + 2*(2*a^4*b + a^3*b*c)*
cos(x))*cos(2*x) + 4*(a^3*b*c*sin(3*x) + a^3*b*c*sin(x) + (2*a^4*c + a^3*c^
2)*sin(2*x))*sin(4*x) + 8*(a^3*b^2*sin(x) + (2*a^4*b + a^3*b*c)*sin(2*x))*s
in(3*x)), x) - ((a^2 + 2*b^2 - 2*a*c)*cos(4*x)^2 + 4*(a^2 + 2*b^2 - 2*a*c)*
cos(2*x)^2 + (a^2 + 2*b^2 - 2*a*c)*sin(4*x)^2 + 4*(a^2 + 2*b^2 - 2*a*c)*sin
(4*x)*sin(2*x) + 4*(a^2 + 2*b^2 - 2*a*c)*sin(2*x)^2 + a^2 + 2*b^2 - 2*a*c +
 2*(a^2 + 2*b^2 - 2*a*c + 2*(a^2 + 2*b^2 - 2*a*c)*cos(2*x))*cos(4*x) + 4*(a
^2 + 2*b^2 - 2*a*c)*cos(2*x))*log(cos(x)^2 + sin(x)^2 + 2*sin(x) + 1) + ((a
^2 + 2*b^2 - 2*a*c)*cos(4*x)^2 + 4*(a^2 + 2*b^2 - 2*a*c)*cos(2*x)^2 + (a^2
+ 2*b^2 - 2*a*c)*sin(4*x)^2 + 4*(a^2 + 2*b^2 - 2*a*c)*sin(4*x)*sin(2*x) + 4
*(a^2 + 2*b^2 - 2*a*c)*sin(2*x)^2 + a^2 + 2*b^2 - 2*a*c + 2*(a^2 + 2*b^2 -
2*a*c + 2*(a^2 + 2*b^2 - 2*a*c)*cos(2*x))*cos(4*x) + 4*(a^2 + 2*b^2 - 2*a*c
)*cos(2*x))*log(cos(x)^2 + sin(x)^2 - 2*sin(x) + 1) + 4*(a^2*cos(3*x) + 2*a
*b*cos(2*x) - a^2*cos(x) + 2*a*b)*sin(4*x) - 4*(2*a^2*cos(2*x) + a^2)*sin(3
*x) - 8*(a^2*cos(x) - a*b)*sin(2*x))/(a^3*cos(4*x)^2 + 4*a^3*cos(2*x)^2 + a
^3*sin(4*x)^2 + 4*a^3*sin(4*x)*sin(2*x) + 4*a^3*sin(2*x)^2 + 4*a^3*cos(2*x)
 + a^3 + 2*(2*a^3*cos(2*x) + a^3)*cos(4*x))
```

mupad [B] time = 14.82, size = 45255, normalized size = 135.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(x)^3*(a + b*cos(x) + c*cos(x)^2)),x)
```

```
[Out] ((tan(x/2)^3*(a + 2*b))/a^2 + (tan(x/2)*(a - 2*b))/a^2)/(tan(x/2)^4 - 2*tan
(x/2)^2 + 1) - atan((((((((2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a
^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*
c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10
*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c +
 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6
*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2
- 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3
+ 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2))/a^8 - (2048*tan(x/2)*((8*a^4*c^6 -
b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 +
33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*
b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*
a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-
(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*
c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3
 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 -
 32*a^8*b^2*c^2)))^(1/2)*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^
5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 12
```

8*a^14*c^3 - 64*a^15*c^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 1
84*a^12*b^4*c + 352*a^13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14
*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^
3 + 96*a^11*b^4*c^2 - 272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2
- 96*a^15*b*c))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3
)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3
*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/
2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a
*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*
(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4
- a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^
2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) + (2048*tan(x/2
)*(8*a^14*c + 8*a^4*b^11 - 24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b
^7 - 49*a^9*b^6 + 33*a^10*b^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*
a^8*c^7 - 136*a^9*c^6 - 192*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13
*c^2 - 8*a^4*b^10*c - 72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8
*b*c^6 + 375*a^8*b^6*c + 496*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 29
5*a^10*b^4*c - 328*a^11*b*c^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b
^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 11
2*a^5*b^8*c^2 + 220*a^6*b^4*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^
6*b^7*c^2 - 256*a^7*b^2*c^6 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b
^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*
c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2
 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a
^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2
 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3
*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c -
 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2
) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3
)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^
8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2
 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2048*(26*a^3*b^11 - 12*a^2*b^
12 - 30*a^4*b^10 + 29*a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b
^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a
^11*c^3 + 20*a^2*b^11*c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 9
6*a^6*b*c^7 - 238*a^6*b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5
 - 72*a^8*b^5*c + 112*a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3
*c + 8*a^11*b*c^2 + 8*a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^
3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4
*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^
2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4
- 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 5
83*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^
7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^
3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c

^2))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b
^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 +
96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b
^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3
)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c -
b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 +
16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b
^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2048*tan(x/2)*(4*a*b^12
+ 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^
4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^
8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c
^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^
3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6
*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a
^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b
^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*
c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 -
704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^
4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5
*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3
+ 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8
*b^2*c^3 + 24*a*b^11*c))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c
- b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2
- 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^
2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c
^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2
*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*
(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c -
8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*1i - (
((((2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 +
48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20
*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^
4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^
13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5
+ 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 4
96*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 2
04*a^12*b^2*c^2))/a^8 + (2048*tan(x/2)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7
*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^
2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4
*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) +
3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2)
- 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^
7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/
2)*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a

^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c
^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^
13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^
3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 -
272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)*(
(8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10
*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*
c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*
b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4
*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/
2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4
 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*
a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2048*tan(x/2)*(8*a^14*c + 8*a^4*b^
11 - 24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a
^10*b^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6
- 192*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c -
72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c
 + 496*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^1
1*b*c^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 -
 8*a^4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^
6*b^4*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^
2*c^6 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c
^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2
+ 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 +
770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8)*((8*a^4*c^6 - b^10
 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a
^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*
c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c
- b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a
*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-
(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 1
6*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*
a^8*b^2*c^2)))^(1/2) - (2048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*
a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a
^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*
c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*
b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*
a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*
a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^
7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5
 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 +
364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 63
5*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a
^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^
4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^

2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c^2))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) + (2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*1i)/((4096*(14*a^3*c^9 + a^4*c^8 - 10*a^5*c^7 + 3*a^6*c^6 - 4*b^4*c^8 + 16*b^5*c^7 - 24*b^6*c^6 + 16*b^7*c^5 - 4*b^8*c^4 + 4*a*b^2*c^9 - 28*a*b^3*c^8 + 56*a*b^4*c^7 - 40*a*b^5*c^6 + 4*a*b^6*c^5 + 4*a*b^7*c^4 + 12*a^2*b*c^9 - 22*a^3*b*c^8 + 4*a^4*b*c^7 + 6*a^5*b*c^6 - 2*a^6*b*c^5 - 48*a^2*b^2*c^8 + 48*a^2*b^3*c^7 - 8*a^2*b^4*c^6 - 4*a^2*b^6*c^4 + 4*a^3*b^2*c^7 - 4*a^3*b^3*c^6 + 4*a^3*b^5*c^4 + 10*a^4*b^2*c^6 - 8*a^4*b^3*c^5 - a^4*b^4*c^4 - a^5*b^2*c^5 + a^5*b^3*c^4))/a^8 + (((((2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2))/a^8 - (2048*tan(x/2)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^

2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4
*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) +
3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2)
 - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(
1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^
7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/
2)*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a
^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c
^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^
13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^
3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 -
272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)*(
(8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10
*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*
c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*
b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4
*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/
2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4
 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*
a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) + (2048*tan(x/2)*(8*a^14*c + 8*a^4*b^
11 - 24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a
^10*b^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6
 - 192*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c -
72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c
 + 496*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^1
1*b*c^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 -
 8*a^4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^
6*b^4*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^
2*c^6 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c
^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2
+ 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 +
770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8)*((8*a^4*c^6 - b^10
 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a
^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*
c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c
 - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a
*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-
(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 1
6*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*
a^8*b^2*c^2)))^(1/2) - (2048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*
a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a
^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*
c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*
b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*
a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*

a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c^2))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) + (((((2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2))/a^8 + (2048*tan(x/2)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2)

+ b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^
5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12
*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^
2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*
c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b
^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a
^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*(32*a^16*c + 8*a^10*b^
7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15*b^2 + 96
*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2 - 8*a^10*b^6*c - 56*a^
11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*b*c^3 - 200*a^13*b^3*c
+ 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*b^5*c^2 - 56*a
^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272*a^12*b^2*c^3 + 8*a^12
*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5
c^5 - b^7(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c
^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^
5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3
)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2
)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c -
b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c
^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*
c^2)))^(1/2) - (2048*tan(x/2)*(8*a^14*c + 8*a^4*b^11 - 24*a^5*b^10 + 36*a^6
*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^10*b^5 - 17*a^11*b^4 + 6
*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192*a^10*c^5 + 168*a^11
*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - 72*a^5*b^9*c + 244*a^6*b^
8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c + 496*a^9*b*c^5 - 416*a^
9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^11*b*c^3 - 178*a^11*b^3*c
+ 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9*c^2 - 72*a^5*b
^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^6*b^4*c^5 - 140*a^6*b^5*c
^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^2*c^6 + 192*a^7*b^3*c^5 +
416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2*c^5 - 115
2*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c^4 - 494*a
^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^2 - 416*a^
11*b^2*c^2 - 24*a^13*b*c))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a
*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c
^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c -
b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b
c^4(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a
^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(
2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c
- 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2
048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*a^5*b^9 - 20*a^6*b^8 + 10
*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^8*c^6 - 44*
a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*c + 98*a^3*b^10*c - 228*a
^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*b^7*c - 200*a^7*b*c^6 + 1
54*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*a^9*b*c^4 + 27*a^9*b^4*c

- 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c^2))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) + (2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)))*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*2i - atan(((

((((2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 +
48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20
*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^
4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^
13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5
+ 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 4
96*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 2
04*a^12*b^2*c^2))/a^8 - (2048*tan(x/2)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^
7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a
^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(
4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) +
3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2
) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^
(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a
^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1
/2)*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*
a^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*
c^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a
^13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c
^3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 -
272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)*
(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 +
10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^
4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*
a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) +
4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(
1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c
^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 -
8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) + (2048*tan(x/2)*(8*a^14*c + 8*a^4*
b^11 - 24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33
*a^10*b^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^
6 - 192*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c
- 72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6
*c + 496*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a
^11*b*c^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3
- 8*a^4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*
a^6*b^4*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*
b^2*c^6 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6
*c^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^
2 + 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3
+ 770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8)*(-(b^10 - 8*a^4*
c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 3
3*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b
^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a
*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(

4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c
*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3
+ 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 -
32*a^8*b^2*c^2)))^(1/2) - (2048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 +
29*a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 8
8*a^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^
11*c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a
^6*b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 1
12*a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 +
8*a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3
*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*
c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7
+ 364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 +
635*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 56
4*a^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7
*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4
*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c^2))/a^8)*(-(b^10 -
8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*
c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 6
6*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3
*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*
c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*
a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a
^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2
*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b
^13 - 4*a^2*b^11 + 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8
+ 2*a^6*c^7 + 38*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4
+ 40*b^10*c^3 - 40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4
+ 320*a*b^9*c^3 - 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b
*c^8 - 31*a^4*b^8*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6
*c - 84*a^7*b*c^5 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a
^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^
2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*
c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 +
541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^
5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*
c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 +
82*a^7*b^2*c^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^
11*c))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2)
- b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5
- 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*
a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2
)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c
- b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^
6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^

6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*1i - (((((2048*(26*a^9*
b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6 + 17
6*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a
^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4*
c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8*
b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4
 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 -
 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2))
/a^8 + (2048*tan(x/2)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)
^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a
^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(
1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4
*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^
2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^
4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*
b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*(32*a^16*c +
8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15
*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2 - 8*a^10*b^6*
c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*b*c^3 - 200*a
^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*b^5*c
^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272*a^12*b^2*c^3
 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)*(-(b^10 - 8*a^4*c
^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33
*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^
2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*
c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4
*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*
(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 +
 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 3
2*a^8*b^2*c^2)))^(1/2) - (2048*tan(x/2)*(8*a^14*c + 8*a^4*b^11 - 24*a^5*b^1
0 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^10*b^5 - 17*a^
11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192*a^10*c^5
 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - 72*a^5*b^9*c +
244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c + 496*a^9*b*c^
5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^11*b*c^3 - 178*a
^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9*c^2
- 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^6*b^4*c^5 - 140
*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^2*c^6 + 192*a^7
*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2
*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c
^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^
2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 -
 b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 5
2*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*
(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2

) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(
1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^
3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 1
0*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))
^(1/2) - (2048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*a^5*b^9 - 20*a
^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^
8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*c + 98*a^3*b^1
0*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*b^7*c - 200*a^
7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*a^9*b*c^4 + 27
*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*a^2*b^8*c^4 -
20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*
b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6
*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^
6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2
- 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 6
55*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^
7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^
2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c^2))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^
5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*
c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b
^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^
3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^
2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c
- b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*
c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2
*c^2)))^(1/2) + (2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11
+ 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38
*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 -
40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3
- 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8
*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5
 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*
a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b
^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*
c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 -
 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^
5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*
c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 -
40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8)*(-(b^
10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*
b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3
 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3
c^3(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^
3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2)
+ 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 +

32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7
*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*1i)/((4096*(14*a^3*c^9 + a^4*c^8 - 10*a^
5*c^7 + 3*a^6*c^6 - 4*b^4*c^8 + 16*b^5*c^7 - 24*b^6*c^6 + 16*b^7*c^5 - 4*b^
8*c^4 + 4*a*b^2*c^9 - 28*a*b^3*c^8 + 56*a*b^4*c^7 - 40*a*b^5*c^6 + 4*a*b^6*
c^5 + 4*a*b^7*c^4 + 12*a^2*b*c^9 - 22*a^3*b*c^8 + 4*a^4*b*c^7 + 6*a^5*b*c^6
 - 2*a^6*b*c^5 - 48*a^2*b^2*c^8 + 48*a^2*b^3*c^7 - 8*a^2*b^4*c^6 - 4*a^2*b^
6*c^4 + 4*a^3*b^2*c^7 - 4*a^3*b^3*c^6 + 4*a^3*b^5*c^4 + 10*a^4*b^2*c^6 - 8*
a^4*b^3*c^5 - a^4*b^4*c^4 - a^5*b^2*c^5 + a^5*b^3*c^4))/a^8 + (((((2048*(26
*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6
 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c +
 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11
*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8
*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^
3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*
c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*
c^2))/a^8 - (2048*tan(x/2)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c -
 b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 +
 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)
^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4
*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b
^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a
^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8
*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*(32*a^16
*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8
*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2 - 8*a^10
*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*b*c^3 -
200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*
b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272*a^12*b^
2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)*(-(b^10 - 8*
a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3
 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a
^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-
(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3
*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b
^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*
c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^
3 - 32*a^8*b^2*c^2)))^(1/2) + (2048*tan(x/2)*(8*a^14*c + 8*a^4*b^11 - 24*a^
5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^10*b^5 -
17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192*a^10
*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - 72*a^5*b^9
*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c + 496*a^9
*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^11*b*c^3 -
178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9
*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^6*b^4*c^5
 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^2*c^6 + 19

2*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c^2))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c

^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8)*
(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 +
10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^
4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*
a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) +
4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(
1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c
^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 -
8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) + (((((2048*(26*a^9*b^7 - 12*a^8*b^
8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 17
6*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*
a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*
c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^
8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c
^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^
2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2))/a^8 + (2048*ta
n(x/2)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8
*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96
*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8
*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^
(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^
2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 1
6*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4
*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*(32*a^16*c + 8*a^10*b^7 - 24
*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15*b^2 + 96*a^12*
c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2 - 8*a^10*b^6*c - 56*a^11*b^5
*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*b*c^3 - 200*a^13*b^3*c + 288
*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*b^5*c^2 - 56*a^11*b^
2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272*a^12*b^2*c^3 + 8*a^12*b^3*c
^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5
- b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 +
52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2
*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/
2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^
(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)
^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 +
10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2))
)^(1/2) - (2048*tan(x/2)*(8*a^14*c + 8*a^4*b^11 - 24*a^5*b^10 + 36*a^6*b^9
- 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^10*b^5 - 17*a^11*b^4 + 6*a^12
*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192*a^10*c^5 + 168*a^11*c^4
+ 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - 72*a^5*b^9*c + 244*a^6*b^8*c -
308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c + 496*a^9*b*c^5 - 416*a^9*b^5
*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^11*b*c^3 - 178*a^11*b^3*c + 184
*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9*c^2 - 72*a^5*b^6*c^
4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^6*b^4*c^5 - 140*a^6*b^5*c^4 -

424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^2*c^6 + 192*a^7*b^3*c^5 + 416*
a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2*c^5 - 1152*a^8
*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c^4 - 494*a^9*b^
3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^2 - 416*a^11*b^
2*c^2 - 24*a^13*b*c))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c -
b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 +
38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)
^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4
*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b
^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a
^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8
*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) - (2048*
(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*a^5*b^9 - 20*a^6*b^8 + 10*a^7
*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^8*c^6 - 44*a^9*
c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*c + 98*a^3*b^10*c - 228*a^4*b
^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*b^7*c - 200*a^7*b*c^6 + 154*a
^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*a^9*b*c^4 + 27*a^9*b^4*c - 68
*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*a^2*b^8*c^4 - 20*a^2*b^9*c^3
+ 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a
^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*
b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4
*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c
^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2
- 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*
a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9
*b^3*c^2 - 47*a^10*b^2*c^2))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(
4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^
6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c
- b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^
2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 1
0*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2)
)/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^
4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) +
(2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 -
a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a
^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 2
4*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^
2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*
c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4
+ 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 4
60*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^
3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8
*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^
4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*
a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b

^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3
+ 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8)*(-(b^10 - 8*a^4*c^6
- 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^
2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c
^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c -
b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*
c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(
4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16
*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a
^8*b^2*c^2)))^(1/2)))*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)
^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a
^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(
1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4
*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^
2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^
4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*
b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2)*2i + (atan(((
((2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 -
a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a
^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 2
4*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^
2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*
c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4
+ 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 4
60*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^
3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8
*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^
4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*
a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b
^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3
+ 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8 + (((2048*(26*a^3*b^1
1 - 12*a^2*b^12 - 30*a^4*b^10 + 29*a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^
8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^
10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*
a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c +
100*a^8*b*c^5 - 72*a^8*b^5*c + 112*a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3
- 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^1
0*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2
+ 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 2
02*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362
*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^
6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b
^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4
- 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 -
47*a^10*b^2*c^2))/a^8 - (((2048*tan(x/2)*(8*a^14*c + 8*a^4*b^11 - 24*a^5*b^

10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^10*b^5 - 17*a
^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192*a^10*c^5
 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - 72*a^5*b^9*c +
 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c + 496*a^9*b*c
^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^11*b*c^3 - 178*
a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9*c^2
 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^6*b^4*c^5 - 14
0*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^2*c^6 + 192*a^
7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^
2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*
c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c
^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8 + (((2048*(26*a^9*b^7 - 12*a^8*b^
8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 17
6*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*
a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*
c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^
8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c
^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^
2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2))/a^8 - (1024*ta
n(x/2)*(a^2 - 2*a*c + 2*b^2)*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^1
2*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4
 - 128*a^14*c^3 - 64*a^15*c^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4
 + 184*a^12*b^4*c + 352*a^13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*
a^14*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^
3*c^3 + 96*a^11*b^4*c^2 - 272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*
c^2 - 96*a^15*b*c))/a^11)*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*
b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2)*1i)/(2
*a^3) + (((2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^
3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c
^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^1
1*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*
a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 1
68*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*
a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^
7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7
 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 +
8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a
^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*
c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 +
174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7
*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8 - (((2048*(2
6*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*a^5*b^9 - 20*a^6*b^8 + 10*a^7*b
^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^8*c^6 - 44*a^9*c^
5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*c + 98*a^3*b^10*c - 228*a^4*b^9
*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*b^7*c - 200*a^7*b*c^6 + 154*a^7

```
*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*a^9*b*c^4 + 27*a^9*b^4*c - 68*a
^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*a^2*b^8*c^4 - 20*a^2*b^9*c^3 +
4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3
*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^
7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4*c
^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c^6
 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2 -
399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^
8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b
^3*c^2 - 47*a^10*b^2*c^2))/a^8 + (((2048*tan(x/2)*(8*a^14*c + 8*a^4*b^11 -
24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^10*b
^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192
*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - 72*a^
5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c + 49
6*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^11*b*c
^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - 8*a^
4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^6*b^4
*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^2*c^6
 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 +
64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234
*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a
^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8 - (((2048*(26*a^9*b^7 -
12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11
*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6
*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4*c - 14
4*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^
4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*
a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^
10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2))/a^8 +
 (1024*tan(x/2)*(a^2 - 2*a*c + 2*b^2)*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6
 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*
a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a
^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c
^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 4
0*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*
a^13*b^2*c^2 - 96*a^15*b*c))/a^11)*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2
*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^
2)*1i)/(2*a^3))/((4096*(14*a^3*c^9 + a^4*c^8 - 10*a^5*c^7 + 3*a^6*c^6 - 4*b
^4*c^8 + 16*b^5*c^7 - 24*b^6*c^6 + 16*b^7*c^5 - 4*b^8*c^4 + 4*a*b^2*c^9 - 2
8*a*b^3*c^8 + 56*a*b^4*c^7 - 40*a*b^5*c^6 + 4*a*b^6*c^5 + 4*a*b^7*c^4 + 12*
a^2*b*c^9 - 22*a^3*b*c^8 + 4*a^4*b*c^7 + 6*a^5*b*c^6 - 2*a^6*b*c^5 - 48*a^2
*b^2*c^8 + 48*a^2*b^3*c^7 - 8*a^2*b^4*c^6 - 4*a^2*b^6*c^4 + 4*a^3*b^2*c^7 -
 4*a^3*b^3*c^6 + 4*a^3*b^5*c^4 + 10*a^4*b^2*c^6 - 8*a^4*b^3*c^5 - a^4*b^4*c
^4 - a^5*b^2*c^5 + a^5*b^3*c^4))/a^8 - (((2048*tan(x/2)*(4*a*b^12 + 20*b^12
*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44
```

*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20
*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a
*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c -
92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8
*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6
 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 3
2*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*
a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^
3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2
 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*
a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^
5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 +
 24*a*b^11*c))/a^8 + (((2048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*
a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a
^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*
c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*
b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*
a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*
a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^
7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5
 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 +
364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 63
5*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a
^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^
4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^
2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c^2))/a^8 - (((2048*tan
(x/2)*(8*a^14*c + 8*a^4*b^11 - 24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a
^8*b^7 - 49*a^9*b^6 + 33*a^10*b^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 +
 72*a^8*c^7 - 136*a^9*c^6 - 192*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*
a^13*c^2 - 8*a^4*b^10*c - 72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88
*a^8*b*c^6 + 375*a^8*b^6*c + 496*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4
+ 295*a^10*b^4*c - 328*a^11*b*c^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^
12*b^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3
+ 112*a^5*b^8*c^2 + 220*a^6*b^4*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 8
0*a^6*b^7*c^2 - 256*a^7*b^2*c^6 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a
^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*
b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4
*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c
))/a^8 + (((2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^
12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*
c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a
^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2
 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*
b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2
*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3

*c^2 - 204*a^12*b^2*c^2))/a^8 - (1024*tan(x/2)*(a^2 - 2*a*c + 2*b^2)*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^11)*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3) + (((2048*tan(x/2)*(4*a*b^12 + 20*b^12*c - 4*b^13 - 4*a^2*b^11 + 4*a^3*b^10 - a^4*b^9 + a^5*b^8 + 12*a^4*c^9 - 44*a^5*c^8 + 2*a^6*c^7 + 38*a^7*c^6 - 18*a^8*c^5 + 2*a^9*c^4 + 4*b^8*c^5 - 20*b^9*c^4 + 40*b^10*c^3 - 40*b^11*c^2 - 24*a*b^6*c^6 + 136*a*b^7*c^5 - 300*a*b^8*c^4 + 320*a*b^9*c^3 - 160*a*b^10*c^2 - 20*a^2*b^10*c + 20*a^3*b^9*c - 92*a^4*b*c^8 - 31*a^4*b^8*c + 168*a^5*b*c^7 + 4*a^5*b^7*c + 2*a^6*b*c^6 - 8*a^6*b^6*c - 84*a^7*b*c^5 + 26*a^8*b*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^11*c))/a^8 - (((2048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29*a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11*c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6*b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112*a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^10*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^10*b^2*c^2))/a^8 + (((2048*tan(x/2)*(8*a^14*c + 8*a^4*b^11 - 24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^10*b^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - 72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c + 496*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^11*b*c^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^6*b^4*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^2*c^6 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 +

```
 572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 52
1*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a
^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^
13*b*c))/a^8 - (((2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5
- 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32
*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c -
 352*a^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13
*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 4
4*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^
10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^
11*b^3*c^2 - 204*a^12*b^2*c^2))/a^8 + (1024*tan(x/2)*(a^2 - 2*a*c + 2*b^2)*
(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14
*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2
- 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*
b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 -
 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272
*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^11)*(a^
2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c +
 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3)))*(a^2 - 2*a*c + 2*b^2)*1i
)/a^3
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^3(x)}{a + b\cos(x) + c\cos^2(x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(x)**3/(a+b*cos(x)+c*cos(x)**2),x)
```

```
[Out] Integral(sec(x)**3/(a + b*cos(x) + c*cos(x)**2), x)
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)



(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
```

```
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
```

```
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]


AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
```

```
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
   debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
   ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
```

```
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do not
    as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
```

```
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
```

```
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:
```

```
#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]
```

```
def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)
   ))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
   ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type
   (expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
```

```
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
   expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,
   Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
   well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
```

```
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug=False
    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
    sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U
    ']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in
    sagemath

def is_atom(expn):

    debug=False
    if debug: print ("Enter is_atom")


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-
    sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
```

```
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().
    gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],
    Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.
    args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer)
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],
    Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],
    Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.
    args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()
    [1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #
    isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
```

```
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.
    func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(
    expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #
    is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, "
    leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
    expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
```

```
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
        else: #result contains complex but optimal is not
            return "C"
    else: # result do not contain complex, this assumes optimal do not as
well
        if leaf_count_result <= 2*leaf_count_optimal:
            return "A"
        else:
            return "B"
else:
    return "C"
```