

# Computer algebra independent integration tests

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

Nasser M. Abbasi

July 17, 2021

Compiled on July 17, 2021 at 10:42am

## Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	Listing of CAS systems tested . . . . .	3
1.2	Results . . . . .	3
1.3	Performance . . . . .	7
1.4	list of integrals that has no closed form antiderivative . . . . .	8
1.5	list of integrals solved by CAS but has no known antiderivative . . . . .	8
1.6	list of integrals solved by CAS but failed verification . . . . .	8
1.7	Timing . . . . .	9
1.8	Verification . . . . .	9
1.9	Important notes about some of the results . . . . .	9
1.9.1	Important note about Maxima results . . . . .	9
1.9.2	Important note about FriCAS and Giac/XCAS results . . . . .	10
1.9.3	Important note about finding leaf size of antiderivative . . . . .	10
1.9.4	Important note about Mupad results . . . . .	11
1.10	Design of the test system . . . . .	11
<b>2</b>	<b>detailed summary tables of results</b>	<b>13</b>
2.1	List of integrals sorted by grade for each CAS . . . . .	13
2.1.1	Rubi . . . . .	13
2.1.2	Mathematica . . . . .	13
2.1.3	Maple . . . . .	13
2.1.4	Maxima . . . . .	13
2.1.5	FriCAS . . . . .	13
2.1.6	Sympy . . . . .	14
2.1.7	Giac . . . . .	14
2.1.8	Mupad . . . . .	14
2.2	Detailed conclusion table per each integral for all CAS systems . . . . .	15
2.3	Detailed conclusion table specific for Rubi results . . . . .	18
<b>3</b>	<b>Listing of integrals</b>	<b>21</b>
3.1	$\int \frac{\sin^5(x)}{a+b \cos(x)+c \cos^2(x)} dx$ . . . . .	21
3.2	$\int \frac{\sin^3(x)}{a+b \cos(x)+c \cos^2(x)} dx$ . . . . .	25
3.3	$\int \frac{\sin(x)}{a+b \cos(x)+c \cos^2(x)} dx$ . . . . .	28
3.4	$\int \frac{\csc(x)}{a+b \cos(x)+c \cos^2(x)} dx$ . . . . .	31

3.5	$\int \frac{\csc^3(x)}{a+b \cos(x)+c \cos^2(x)} dx$	35
3.6	$\int \frac{\sin^4(x)}{a+b \cos(x)+c \cos^2(x)} dx$	41
3.7	$\int \frac{\sin^2(x)}{a+b \cos(x)+c \cos^2(x)} dx$	66
3.8	$\int \frac{\csc^2(x)}{a+b \cos(x)+c \cos^2(x)} dx$	80
3.9	$\int \frac{\sin(x)}{-2+\cos(x)+\cos^2(x)} dx$	101
3.10	$\int \frac{\sin(x)}{4-5 \cos(x)+\cos^2(x)} dx$	103
3.11	$\int \frac{\sin(x)}{3-2 \cos(x)+\cos^2(x)} dx$	105
3.12	$\int \frac{\sin(x)}{(13-4 \cos(x)+\cos^2(x))^2} dx$	108
3.13	$\int \frac{\cos^4(x)}{a+b \cos(x)+c \cos^2(x)} dx$	111
3.14	$\int \frac{\cos^3(x)}{a+b \cos(x)+c \cos^2(x)} dx$	136
3.15	$\int \frac{\cos^2(x)}{a+b \cos(x)+c \cos^2(x)} dx$	153
3.16	$\int \frac{\cos(x)}{a+b \cos(x)+c \cos^2(x)} dx$	170
3.17	$\int \frac{1}{a+b \cos(x)+c \cos^2(x)} dx$	177
3.18	$\int \frac{\sec(x)}{a+b \cos(x)+c \cos^2(x)} dx$	185
3.19	$\int \frac{\sec^2(x)}{a+b \cos(x)+c \cos^2(x)} dx$	198
3.20	$\int \frac{\sec^3(x)}{a+b \cos(x)+c \cos^2(x)} dx$	213
<b>4</b>	<b>Listing of Grading functions</b>	<b>235</b>
4.0.1	Mathematica and Rubi grading function	235
4.0.2	Maple grading function	237
4.0.3	Sympy grading function	240
4.0.4	SageMath grading function	242

# 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 Hypergeometric<sub>2</sub>F<sub>1</sub> 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 <ol style="list-style-type: none"> <li>1. antiderivative contains a hypergeometric function and the optimal antiderivative does not.</li> <li>2. antiderivative contains a special function and the optimal antiderivative does not.</li> <li>3. antiderivative contains the imaginary unit and the optimal antiderivative does not.</li> </ol>
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.

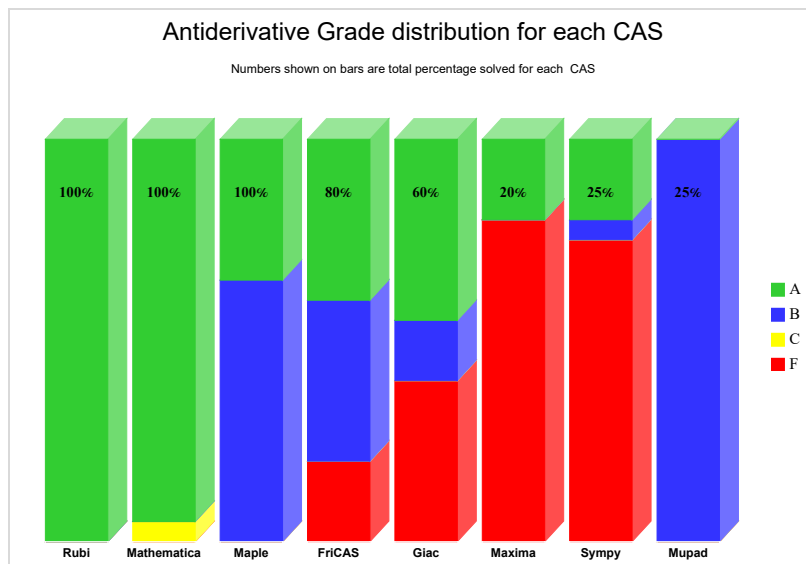
Table 1.2: Description of grading applied to integration result

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

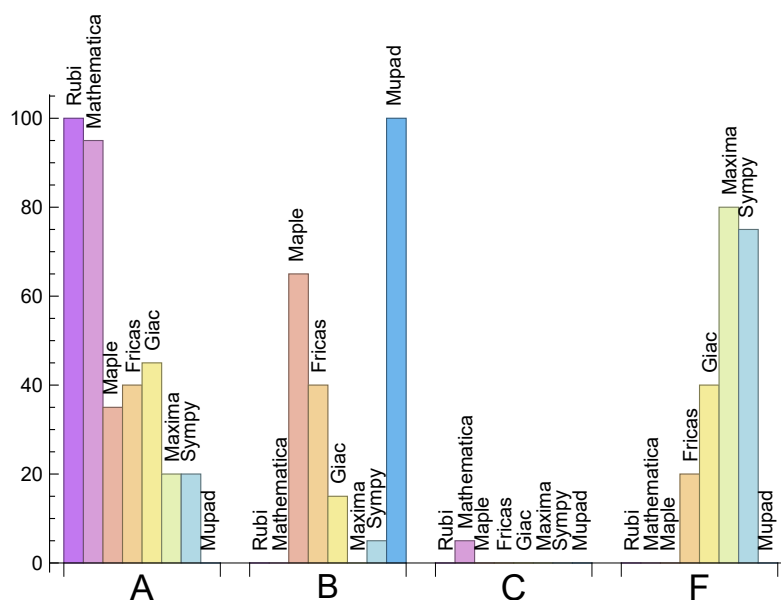
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	95.00	0.00	5.00	0.00
Maple	35.00	65.00	0.00	0.00
Maxima	20.00	0.00	0.00	80.00
Fricas	40.00	40.00	0.00	20.00
Sympy	20.00	5.00	0.00	75.00
Giac	45.00	15.00	0.00	40.00
Mupad	0.00	100.00	0.00	0.00

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 is 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 time-out 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

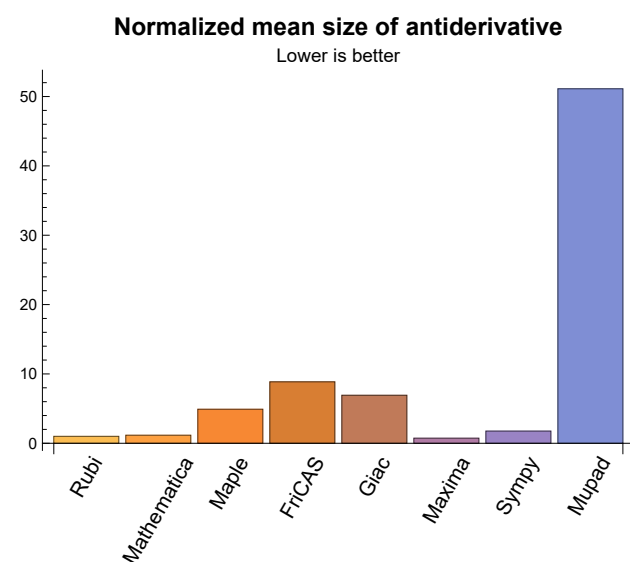
## 1.3 Performance

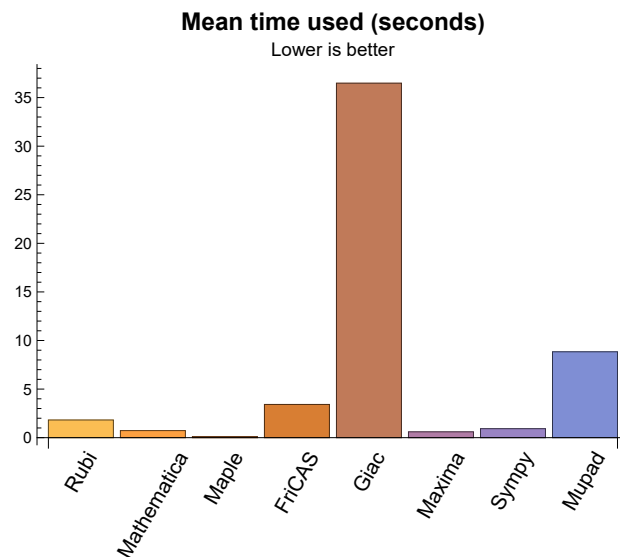
The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

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 `AbsoluteTiming[]` 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 percentage can be higher or lower depending on the specific input test file.

Such integrals can be identified by looking at the output of the integration in each section for Maxima. The exception message will indicate if 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/X-CAS 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/](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.

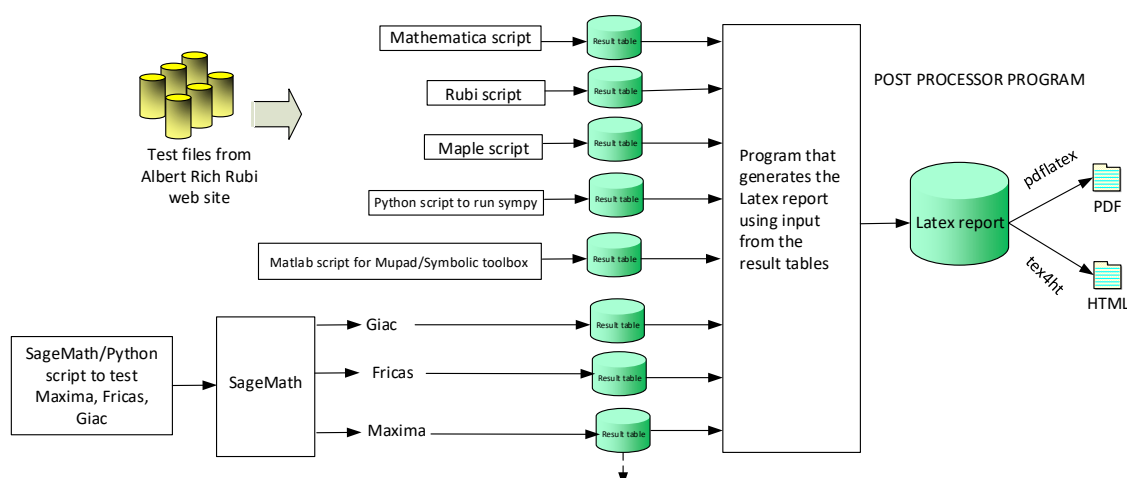
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

```
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.



**One record (line) per one integral result. The line is CSV comma separated. This is description of each record**

1. integer. the problem number.
2. integer. 0 for failed, 1 for passed, -1 for timeout, -2 for CAS specific exception. (this is not the grade field)
3. integer. Leaf size of result.
4. integer. Leaf size of the optimal antiderivative.
5. number. CPU time used to solve this integral. 0 if failed.
6. string. The integral in Latex format
7. string. The input used in CAS own syntax.
8. string. The result (antiderivative) produced by CAS in Latex format
9. string. The optimal antiderivative in Latex format.
10. integer. 0 or 1. Indicates if problem has known antiderivative or not
11. String. The result (antiderivative) in CAS own syntax.
12. String. The grade of the antiderivative. Can be "A", "B", "C", or "F"
- The following field present only in Rubi and Mathematica Tables*
13. integer. 1 if result was verified or 0 if not verified.
- The following fields present only in Rubi Tables*
14. integer. Number of rules used.
15. integer. Integrand leaf size.
16. real number. Ratio of field 14 over field 15
17. integer. 1 if result was verified or 0 if not verified.
18. String of form "{n,n,..}" which is list of the rules used by Rubi

**High level overview of the CAS independent integration 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
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

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	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
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

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

Optimal. Leaf size=136

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

[Out]  $-(b^2 - c(a + 2c)) \cos(x) / c^3 + 1/2 * b * \cos(x)^2 / c^2 - 1/3 * \cos(x)^3 / c + 1/2 * b * (b^2 - 2 * c * (a + c)) * \ln(a + b * \cos(x) + c * \cos(x)^2) / c^4 + (b^4 + 2 * c^2 * (a + c)^2 - 2 * b^2 * c * (2 * a + c)) * \operatorname{arctanh}((b + 2 * c * \cos(x)) / (-4 * a * c + b^2)^{(1/2)}) / c^4 / (-4 * a * c + b^2)^{(1/2)}$

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}

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

Antiderivative was successfully verified.

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

[Out]  $((b^4 + 2 * c^2 * (a + c)^2 - 2 * b^2 * c * (2 * a + c)) * \operatorname{ArcTanh}[(b + 2 * c * \cos(x)) / \sqrt{b^2 - 4 * a * c}]) / (c^4 * \sqrt{b^2 - 4 * a * c}) - ((b^2 - c * (a + 2 * c)) * \cos(x)) / c^3 + (b * \cos(x)^2) / (2 * c^2) - \cos(x)^3 / (3 * c) + (b * (b^2 - 2 * c * (a + c)) * \log[a + b * \cos(x) + c * \cos(x)^2]) / (2 * c^4)$

### 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] && (GtQ[a, 0] || LtQ[b, 0])

### Rule 618

Int[((a\_.) + (b\_.)\*(x\_) + (c\_.)\*(x\_)^2)^(-1), x\_Symbol] :> Dist[-2, Subst[Int[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] :> Simp[(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] := Dist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), Int[(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[ExpandIntegrand[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] && IntegerQ[(m - 1)/2]
```

### Rubi steps

$$\begin{aligned} \int \frac{\sin^5(x)}{a + b \cos(x) + c \cos^2(x)} dx &= -\text{Subst} \left( \int \frac{(1-x^2)^2}{a + bx + cx^2} dx, x, \cos(x) \right) \\ &= -\text{Subst} \left( \int \left( \frac{b^2 - c(a+2c)}{c^3} - \frac{bx}{c^2} + \frac{x^2}{c} - \frac{-a^2c - c^3 + a(b^2 - 2c^2) + b(b^2 - 2c(a+c))}{c^3(a + bx + cx^2)} \right) dx, x, \cos(x) \right) \\ &= -\frac{(b^2 - c(a+2c)) \cos(x)}{c^3} + \frac{b \cos^2(x)}{2c^2} - \frac{\cos^3(x)}{3c} + \frac{\text{Subst} \left( \int \frac{-a^2c - c^3 + a(b^2 - 2c^2) + b(b^2 - 2c(a+c))}{a + bx + cx^2} dx, x, \cos(x) \right)}{c^3} \\ &= -\frac{(b^2 - c(a+2c)) \cos(x)}{c^3} + \frac{b \cos^2(x)}{2c^2} - \frac{\cos^3(x)}{3c} + \frac{(b(b^2 - 2c(a+c))) \text{Subst} \left( \int \frac{1}{a + bx + cx^2} dx, x, \cos(x) \right)}{2c^4} \\ &= -\frac{(b^2 - c(a+2c)) \cos(x)}{c^3} + \frac{b \cos^2(x)}{2c^2} - \frac{\cos^3(x)}{3c} + \frac{b(b^2 - 2c(a+c)) \log(a + b \cos(x) + c \cos^2(x))}{2c^4} \\ &= \frac{(b^4 + 2c^2(a+c)^2 - 2b^2c(2a+c)) \tanh^{-1} \left( \frac{b+2c \cos(x)}{\sqrt{b^2-4ac}} \right) - (b^2 - c(a+2c)) \cos(x)}{c^4 \sqrt{b^2 - 4ac}} + \frac{(b^2 - c(a+2c)) \cos(x)}{c^3} \end{aligned}$$

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

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

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\*

$$c*(a + c)*\text{Sqrt}[b^2 - 4*a*c]*\text{Log}[-b + \text{Sqrt}[b^2 - 4*a*c] - 2*c*\text{Cos}[x]]/\text{Sqrt}[b^2 - 4*a*c] + (6*(b^4 + 2*c^2*(a + c)^2 - 2*b^2*c*(2*a + c) + b^3*\text{Sqrt}[b^2 - 4*a*c] - 2*b*c*(a + c)*\text{Sqrt}[b^2 - 4*a*c])*\text{Log}[b + \text{Sqrt}[b^2 - 4*a*c] + 2*c*\text{Cos}[x]]/\text{Sqrt}[b^2 - 4*a*c])/(12*c^4)$$

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

$$\frac{2(b^2c^3 - 4ac^4)\cos(x)^3 - 3(b^3c^2 - 4abc^3)\cos(x)^2 - 3(b^4 - 4ab^2c + 4ac^3 + 2c^4 + 2(a^2 - b^2)c^2)\sqrt{b^2 - 4ac}}{\dots}$$

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)\*arctan(-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

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

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

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

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 additional constraints; using the 'assume' command before evaluation \*may\* help (example of legal syntax is 'assume(4\*a\*c-b^2>0)', see `assume?` for more details)Is 4\*a\*c-b^2 positive or negative?

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

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

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\*cos(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



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

Optimal. Leaf size=76

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

[Out]  $\cos(x)/c - 1/2*b*\ln(a+b*\cos(x)+c*\cos(x)^2)/c^2 - (b^2-2*c*(a+c))*\operatorname{arctanh}((b+2*c*\cos(x))/(-4*a*c+b^2)^{(1/2)})/c^2/(-4*a*c+b^2)^{(1/2)}$

**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}

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

Antiderivative was successfully verified.

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

[Out]  $-(((b^2 - 2*c*(a + c))*\operatorname{ArcTanh}[(b + 2*c*\cos(x))/\operatorname{Sqrt}[b^2 - 4*a*c]])/(c^2*\operatorname{Sqrt}[b^2 - 4*a*c])) + \cos(x)/c - (b*\log[a + b*\cos(x) + c*\cos(x)^2])/(2*c^2)$

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] && (GtQ[a, 0] || LtQ[b, 0])

Rule 618

Int(((a\_.) + (b\_.)\*(x\_) + (c\_.)\*(x\_)^2)^(-1), x\_Symbol] :> Dist[-2, Subst[Int[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] :> Simp[(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] :> Dist[(2\*c\*d - b\*e)/(2\*c), Int[1/(a + b\*x + c\*x^2), x], x] + Dist[e/(2\*c), Int[(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[ExpandIntegrand[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

$$\begin{aligned}
\int \frac{\sin^3(x)}{a + b \cos(x) + c \cos^2(x)} dx &= -\text{Subst}\left(\int \frac{1 - x^2}{a + bx + cx^2} dx, x, \cos(x)\right) \\
&= -\text{Subst}\left(\int \left(-\frac{1}{c} + \frac{a + c + bx}{c(a + bx + cx^2)}\right) dx, x, \cos(x)\right) \\
&= \frac{\cos(x)}{c} - \frac{\text{Subst}\left(\int \frac{a + c + bx}{a + bx + cx^2} dx, x, \cos(x)\right)}{c} \\
&= \frac{\cos(x)}{c} - \frac{b \text{Subst}\left(\int \frac{b + 2cx}{a + bx + cx^2} dx, x, \cos(x)\right)}{2c^2} + \frac{(b^2 - 2c(a + c)) \text{Subst}\left(\int \frac{1}{a + bx + cx^2} dx, x, \cos(x)\right)}{2c^2} \\
&= \frac{\cos(x)}{c} - \frac{b \log(a + b \cos(x) + c \cos^2(x))}{2c^2} - \frac{(b^2 - 2c(a + c)) \text{Subst}\left(\int \frac{1}{b^2 - 4ac - x^2} dx, x, \cos(x)\right)}{c^2} \\
&= -\frac{(b^2 - 2c(a + c)) \tanh^{-1}\left(\frac{b + 2c \cos(x)}{\sqrt{b^2 - 4ac}}\right)}{c^2 \sqrt{b^2 - 4ac}} + \frac{\cos(x)}{c} - \frac{b \log(a + b \cos(x) + c \cos^2(x))}{2c^2}
\end{aligned}$$

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

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

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])\*Log[-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

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

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

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

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

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

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 additional constraints; using the 'assume' command before evaluation \*may\* help (example of legal syntax is 'assume(4\*a\*c-b^2>0)', see 'assume?' for more details)Is 4\*a\*c-b^2 positive or negative?

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

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

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 - (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\*cos(x))/(4\*a\*c - b^2)^(1/2)))/(c\*(4\*a\*c - b^2)^(1/2)) - (2\*a\*b\*c\*log(a + b\*cos(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

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

**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] && (GtQ[a, 0] || LtQ[b, 0])

**Rule 618**

Int[((a\_.) + (b\_.)\*(x\_) + (c\_.)\*(x\_)^2)^(-1), x\_Symbol] := Dist[-2, Subst[Int[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] && IntegerQ[(m - 1)/2]

**Rubi steps**

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

**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

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

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

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

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

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

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 additional constraints; using the 'assume' command before evaluation \*may\* help (example of legal syntax is 'assume(4\*a\*c-b^2>0)', see 'assume?' for more details) Is 4\*a\*c-b^2 positive or negative?

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $-(2*\operatorname{atan}(b/(4*a*c - b^2)^{(1/2)} + (2*c*\cos(x))/(4*a*c - b^2)^{(1/2)}))/(4*a*c - b^2)^{(1/2)}$

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

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

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, Eq(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

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

[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}

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

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] && (GtQ[a, 0] || LtQ[b, 0])

#### Rule 618

Int[((a\_.) + (b\_.)\*(x\_) + (c\_.)\*(x\_)^2)^-1, x\_Symbol] := Dist[-2, Subst[Int[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] := Simp[(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] := Dist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), Int[(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] && IntegerQ[(m - 1)/2]
```

### Rubi steps

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

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

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

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 + Cos[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

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

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]  $[-1/2*((b^2 - 2*a*c - 2*c^2)*\text{sqrt}(b^2 - 4*a*c)*\log(-(2*c^2*\cos(x)^2 + 2*b*c*\cos(x) + b^2 - 2*a*c + \text{sqrt}(b^2 - 4*a*c)*(2*c*\cos(x) + b))/(c*\cos(x)^2 + b*\cos(x) + a)) - (b^3 - 4*a*b*c)*\log(c*\cos(x)^2 + b*\cos(x) + a) + (a*b^2 + b^3 - 4*a*c^2 - (4*a^2 + 4*a*b - b^2)*c)*\log(1/2*\cos(x) + 1/2) - (a*b^2 - b^3 - 4*a*c^2 - (4*a^2 - 4*a*b - b^2)*c)*\log(-1/2*\cos(x) + 1/2))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c), -1/2*(2*(b^2 - 2*a*c - 2*c^2)*\text{sqrt}(-b^2 + 4*a*c)*\arctan(-\text{sqrt}(-b^2 + 4*a*c)*(2*c*\cos(x) + b)/(b^2 - 4*a*c)) - (b^3 - 4*a*b*c)*\log(c*\cos(x)^2 + b*\cos(x) + a) + (a*b^2 + b^3 - 4*a*c^2 - (4*a^2 + 4*a*b - b^2)*c)*\log(1/2*\cos(x) + 1/2) - (a*b^2 - b^3 - 4*a*c^2 - (4*a^2 - 4*a*b - b^2)*c)*\log(-1/2*\cos(x) + 1/2))/(a^2*b^2 - b^4 - 4*a*c^3 - (8*a^2 - b^2)*c^2 - 2*(2*a^3 - 3*a*b^2)*c)]$

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

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

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]  $1/2*b*\log(c*\cos(x)^2 + b*\cos(x) + a)/(a^2 - b^2 + 2*a*c + c^2) + (b^2 - 2*a*c - 2*c^2)*\arctan((2*c*\cos(x) + b)/\text{sqrt}(-b^2 + 4*a*c))/((a^2 - b^2 + 2*a*c + c^2)*\text{sqrt}(-b^2 + 4*a*c)) - 1/2*\log(\cos(x) + 1)/(a - b + c) + 1/2*\log(-\cos(x) + 1)/(a + b + c)$

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

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

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 additional constraints; using the 'assume' command before evaluation \*may\* help (example of legal syntax is 'assume(4\*a\*c-b^2>0)', see 'assume?' for more details)Is 4\*a\*c-b^2 positive or negative?

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

$$\frac{\ln(\cos(x)-1)}{2(a+b+c)} - \frac{\ln(\cos(x)+1)}{2(a-b+c)} - \frac{\ln\left(b c^2 + 4 c^3 \cos(x) + \frac{(a(4bc-2c\sqrt{b^2-4ac})-b^3+b^2\sqrt{b^2-4ac}-2c^2\sqrt{b^2-4ac})(8ac^3+\cos(x))}{b^2(12ac+2a^2-2b^2+2c^2)-4ac(4ac+2a^2+2c^2)}\right)}{b^2(12ac+2a^2-2b^2+2c^2)-4ac(4ac+2a^2+2c^2)}$$

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]  $\log(\cos(x) - 1)/(2*(a + b + c)) - \log(\cos(x) + 1)/(2*(a - b + c)) - (\log(b*c^2 + 4*c^3*\cos(x) + ((a*(4*b*c - 2*c*(b^2 - 4*a*c))^{1/2}) - b^3 + b^2*(b^2 - 4*a*c)^{1/2} - 2*c^2*(b^2 - 4*a*c)^{1/2})*(8*a*c^3 + \cos(x)*(12*b*c^3 - 3*b^3*c + 12*a*b*c^2) + 4*c^4 + 4*a^2*c^2 + 3*b^2*c^2 - ((a*(4*b*c - 2*c*(b^2 - 4*a*c))^{1/2}) - b^3 + b^2*(b^2 - 4*a*c)^{1/2} - 2*c^2*(b^2 - 4*a*c)^{1/2})*(4*b*c^4 + 4*b^3*c^2 + \cos(x)*(8*a*c^4 + 6*b^4*c + 8*c^5 - 8*a^2*c^3 - 8*a^3*c^2 - 6*b^2*c^3 - 20*a*b^2*c^2 + 2*a^2*b^2*c) - 28*a^2*b*c^2 - 24*a*b*c^3 + 8*a*b^3*c))/(b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2)) - a*b^2*c))/(b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2)))*(a*(4*b*c - 2*c*(b^2 - 4*a*c))^{1/2}) - b^3 + b^2*(b^2 - 4*a*c)^{1/2} - 2*c^2*(b^2 - 4*a*c)^{1/2}))/((b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2)) - (log(b*c^2 + 4*c^3*cos(x) + ((a*(4*b*c + 2*c*(b^2 - 4*a*c))^{1/2}) - b^3 - b^2*(b^2 - 4*a*c)^{1/2} + 2*c^2*(b^2 - 4*a*c)^{1/2})*(8*a*c^3 + \cos(x)*(12*b*c^3 - 3*b^3*c + 12*a*b*c^2) + 4*c^4 + 4*a^2*c^2 + 3*b^2*c^2 - ((a*(4*b*c + 2*c*(b^2 - 4*a*c))^{1/2}) - b^3 - b^2*(b^2 - 4*a*c)^{1/2} + 2*c^2*(b^2 - 4*a*c)^{1/2})*(4*b*c^4 + 4*b^3*c^2 + \cos(x)*(8*a*c^4 + 6*b^4*c + 8*c^5 - 8*a^2*c^3 - 8*a^3*c^2 - 6*b^2*c^3 - 20*a*b^2*c^2 + 2*a^2*b^2*c) - 28*a^2*b*c^2 - 24*a*b*c^3 + 8*a*b^3*c))/(b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2)) - a*b^2*c))/(b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2)))*(a*(4*b*c + 2*c*(b^2 - 4*a*c))^{1/2}) - b^3 - b^2*(b^2 - 4*a*c)^{1/2} + 2*c^2*(b^2 - 4*a*c)^{1/2}))/((b^2*(12*a*c + 2*a^2 - 2*b^2 + 2*c^2) - 4*a*c*(4*a*c + 2*a^2 + 2*c^2))$

**sympy [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)

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

**Optimal.** Leaf size=205

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

[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}

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

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] && (GtQ[a, 0] || LtQ[b, 0])

### Rule 618

Int[((a\_.) + (b\_.)\*(x\_) + (c\_.)\*(x\_)^2)^-1, x\_Symbol] :> Dist[-2, Subst[Int[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] :> Simp[(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] := Dist[(2\*c\*d - b\*e)/(2\*c), Int[1/(a + b\*x + c\*x^2), x], x] + Dist[e/(2\*c), Int[(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] /; 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] && IntegerQ[(m - 1)/2]

#### Rubi steps

$$\begin{aligned}
\int \frac{\csc^3(x)}{a + b \cos(x) + c \cos^2(x)} dx &= -\text{Subst} \left( \int \frac{1}{(1-x^2)^2 (a+bx+cx^2)} dx, x, \cos(x) \right) \\
&= \frac{(b - (a + c) \cos(x)) \csc^2(x)}{2(a - b + c)(a + b + c)} - \frac{\text{Subst} \left( \int \frac{2(a^2 - 2b^2 + 3ac + 2c^2) + 2b(a-c)x + 2c(a+c)x^2}{(1-x^2)(a+bx+cx^2)} dx, x \right)}{4(a - b + c)(a + b + c)} \\
&= \frac{(b - (a + c) \cos(x)) \csc^2(x)}{2(a - b + c)(a + b + c)} - \frac{\text{Subst} \left( \int \frac{-2b^2(a-c) + 2ac(a+c) + 2c^2(a+c) + 2a(a^2 - 2b^2 + 3ac + 2c^2)x + 2c(a+c)x^2}{(1-x^2)(a+bx+cx^2)} dx, x \right)}{4(a - b + c)(a + b + c)} \\
&= \frac{(b - (a + c) \cos(x)) \csc^2(x)}{2(a - b + c)(a + b + c)} + \frac{(a - 2b + 3c) \text{Subst} \left( \int \frac{1}{-1-x} dx, x, \cos(x) \right)}{4(a - b + c)^2} - \frac{(a - 2b + 3c) \log(1 - \cos(x))}{4(a - b + c)^2} \\
&= \frac{(b - (a + c) \cos(x)) \csc^2(x)}{2(a - b + c)(a + b + c)} + \frac{(a + 2b + 3c) \log(1 - \cos(x))}{4(a + b + c)^2} - \frac{(a - 2b + 3c) \log(1 + \cos(x))}{4(a - b + c)^2} \\
&= \frac{(b^4 + 2c^2(a + c)^2 - 2b^2c(2a + c)) \tanh^{-1} \left( \frac{b + 2c \cos(x)}{\sqrt{b^2 - 4ac}} \right)}{(a - b + c)^2(a + b + c)^2 \sqrt{b^2 - 4ac}} + \frac{(b - (a + c) \cos(x)) \csc^2(x)}{2(a - b + c)(a + b + c)}
\end{aligned}$$

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

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

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[Cos[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]])/(Sqrt[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 - (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\*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 - (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

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

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)\*arctan((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

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

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}(\csc(x)^3/(a+b*\cos(x)+c*\cos(x)^2), x)$

[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]  $\text{integrate}(\csc(x)^3/(a+b*\cos(x)+c*\cos(x)^2), x, \text{algorithm}="maxima")$

[Out] Exception raised: ValueError >> Computation failed since Maxima requested additional constraints; using the 'assume' command before evaluation \*may\* help (example of legal syntax is 'assume(4\*a\*c-b^2>0)', see 'assume?' for more 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]  $\text{int}(1/(\sin(x)^3*(a + b*\cos(x) + c*\cos(x)^2)), x)$

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

$$\begin{aligned} &^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 + 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^{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) \end{aligned}$$

**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)



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

Optimal. Leaf size=388

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

[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\*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^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}

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

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 - Sqrt[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 + 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 + 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] && IntegerQ[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

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

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

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

Antiderivative was successfully verified.

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

[Out]  $(4*b^2*x - 2*c*(2*a + 3*c)*x + (4*\sqrt{2}*(b^4 + 2*c^2*(a + c)^2 - 2*b^2*c*(2*a + c) + b^3*\sqrt{b^2 - 4*a*c} - 2*b*c*(a + c)*\sqrt{b^2 - 4*a*c}))*\text{ArcTan}h[\frac{(b - 2*c + \sqrt{b^2 - 4*a*c})*\text{Tan}[x/2]}{\sqrt{-2*b^2 + 4*c*(a + c) - 2*b*\sqrt{b^2 - 4*a*c}}}] / ((\sqrt{b^2 - 4*a*c})*\sqrt{-b^2 + 2*c*(a + c) - b*\sqrt{b^2 - 4*a*c}}) - (4*\sqrt{2}*(-b^4 - 2*c^2*(a + c)^2 + 2*b^2*c*(2*a + c) + b^3*\sqrt{b^2 - 4*a*c} - 2*b*c*(a + c)*\sqrt{b^2 - 4*a*c}))*\text{ArcTanh}[\frac{(-b + 2*c + \sqrt{b^2 - 4*a*c})*\text{Tan}[x/2]}{\sqrt{-2*b^2 + 4*c*(a + c) + 2*b*\sqrt{b^2 - 4*a*c}}}] / ((\sqrt{b^2 - 4*a*c})*\sqrt{-b^2 + 2*c*(a + c) + b*\sqrt{b^2 - 4*a*c}}) - 4*b*c*\text{Sin}[x] + c^2*\text{Sin}[2*x]) / (4*c^3)$

**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]  $\frac{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}))) / (b^2*c^6 - 4*a*c^7))$

$$\begin{aligned}
 & \left. (b^2c^{12} - 4a^2c^{13}) \right) \sin(x) - (b^8c - 8a^2b^6c^2 - 12a^4b^2c^6 - 3 \\
 & * (8a^2b^2 - b^4) c^5 - 6(2a^3b^2 - 3a^4b) c^4 + (19a^2b^4 - 3b^6) \\
 & * c^3) \sin(x) \sqrt{-(b^6 - 6a^2b^4c - 6a^4c^5 - 2c^6 - 3(2a^2 - b^2) c^4 \\
 & - 2(a^3 - 6a^2b^2) c^3 + 3(3a^2b^2 - b^4) c^2 + (b^2c^6 - 4a^4c^7) * s \\
 & \text{qrt}((b^{10} - 8a^2b^8c + 36a^4b^2c^7 + 9b^2c^8 + 18(3a^2b^2 - b^4) c^6 \\
 & + 12(3a^3b^2 - 5a^4b^4) c^5 + 3(3a^4b^2 - 22a^2b^4 + 5b^6) c^4 - \\
 & 12(2a^3b^4 - 3a^4b^6) c^3 + 2(11a^2b^6 - 3b^8) c^2) / (b^2c^{12} - 4a^2c^{13}))} \\
 & / (b^2c^6 - 4a^4c^7)) + (a^2b^6 - b^8 + 12a^2b^2c^5 + 3b^2c^6 + \\
 & 6(3a^2b^2 - b^4) c^4 + 4(3a^3b^2 - 4a^4b^4) c^3 + (3a^4b^2 - 14a^2 \\
 & * b^4 + 4b^6) c^2 - 2(2a^3b^4 - 3a^4b^6) c) \cos(x) + \sqrt{2} c^3 \sqrt{-( \\
 & (b^6 - 6a^2b^4c - 6a^4c^5 - 2c^6 - 3(2a^2 - b^2) c^4 - 2(a^3 - 6a^2b^2) \\
 & ) c^3 + 3(3a^2b^2 - b^4) c^2 - (b^2c^6 - 4a^4c^7) \sqrt{(b^{10} - 8a^2b^8c \\
 & + 36a^4b^2c^7 + 9b^2c^8 + 18(3a^2b^2 - b^4) c^6 + 12(3a^3b^2 - 5 \\
 & * a^4b^4) c^5 + 3(3a^4b^2 - 22a^2b^4 + 5b^6) c^4 - 12(2a^3b^4 - 3a^4b^6) \\
 & * c^3 + 2(11a^2b^6 - 3b^8) c^2) / (b^2c^{12} - 4a^2c^{13}))} / (b^2c^6 - 4 \\
 & * a^4c^7)) \log(-24a^2b^2c^6 - 6b^2c^7 - 12(3a^2b^2 - b^4) c^5 - 8(3a^3b^2 - \\
 & 4a^4b^3) c^4 - 2(3a^4b^2 - 14a^2b^3 + 4b^5) c^3 + 4(2a^3b^3 - 3a^4b^5) \\
 & * c^2 - (4a^4c^9 + (8a^2 - b^2) c^8 + 2(2a^3 - 3a^2b^2) c^7 - (a^2b^2 - \\
 & b^4) c^6) \sqrt{(b^{10} - 8a^2b^8c + 36a^4b^2c^7 + 9b^2c^8 + 18(3a^2b^2 - b^4) \\
 & * c^6 + 12(3a^3b^2 - 5a^4b^4) c^5 + 3(3a^4b^2 - 22a^2b^4 + 5b^6) c^4 - 12(2a^3b^4 - 3a^4b^6) \\
 & * c^3 + 2(11a^2b^6 - 3b^8) c^2) / (b^2c^{12} - 4a^2c^{13}))} \cos(x) - 2(a^2b^5 - b^7) c \\
 & + 1/2 \sqrt{2} ((b^4c^7 - 6a^2b^2c^8 + 8a^4c^{10} + 2(4a^2 - b^2) c^9) \sqrt{(b^{10} - 8a^2b^8c + 36a \\
 & * b^2c^7 + 9b^2c^8 + 18(3a^2b^2 - b^4) c^6 + 12(3a^3b^2 - 5a^4b^4) \\
 & * c^5 + 3(3a^4b^2 - 22a^2b^4 + 5b^6) c^4 - 12(2a^3b^4 - 3a^4b^6) \\
 & * c^3 + 2(11a^2b^6 - 3b^8) c^2) / (b^2c^{12} - 4a^2c^{13})) \sin(x) + (b^8c - 8a \\
 & * b^6c^2 - 12a^2b^2c^6 - 3(8a^2b^2 - b^4) c^5 - 6(2a^3b^2 - 3a^4b^4) \\
 & * c^4 + (19a^2b^4 - 3b^6) c^3) \sin(x) \sqrt{-(b^6 - 6a^2b^4c - 6a^4c^5 - \\
 & 2c^6 - 3(2a^2 - b^2) c^4 - 2(a^3 - 6a^2b^2) c^3 + 3(3a^2b^2 - b^4) \\
 & * c^2 - (b^2c^6 - 4a^4c^7) \sqrt{(b^{10} - 8a^2b^8c + 36a^4b^2c^7 + 9b^2c^8 \\
 & + 18(3a^2b^2 - b^4) c^6 + 12(3a^3b^2 - 5a^4b^4) c^5 + 3(3a^4b^2 - 22a^2b^4 + 5b^6) \\
 & * c^4 - 12(2a^3b^4 - 3a^4b^6) c^3 + 2(11a^2b^6 - 3b^8) c^2) / (b^2c^{12} \\
 & - 4a^2c^{13}))} / (b^2c^6 - 4a^4c^7)) - (a^2b^6 - b^8 + \\
 & 12a^2b^2c^5 + 3b^2c^6 + 6(3a^2b^2 - b^4) c^4 + 4(3a^3b^2 - 4a^4b^4) \\
 & ) c^3 + (3a^4b^2 - 14a^2b^4 + 4b^6) c^2 - 2(2a^3b^4 - 3a^4b^6) c) \cos \\
 & (x) - \sqrt{2} c^3 \sqrt{-(b^6 - 6a^2b^4c - 6a^4c^5 - 2c^6 - 3(2a^2 - \\
 & b^2) c^4 - 2(a^3 - 6a^2b^2) c^3 + 3(3a^2b^2 - b^4) c^2 - (b^2c^6 - 4a^4c^7) \\
 & * \sqrt{(b^{10} - 8a^2b^8c + 36a^4b^2c^7 + 9b^2c^8 + 18(3a^2b^2 - b^4) \\
 & * c^6 + 12(3a^3b^2 - 5a^4b^4) c^5 + 3(3a^4b^2 - 22a^2b^4 + 5b^6) \\
 & * c^4 - 12(2a^3b^4 - 3a^4b^6) c^3 + 2(11a^2b^6 - 3b^8) c^2) / (b^2c^{12} \\
 & - 4a^2c^{13}))} / (b^2c^6 - 4a^4c^7)) \log(-24a^2b^2c^6 - 6b^2c^7 - 12(3a^2b^2 - \\
 & b^4) c^5 - 8(3a^3b^2 - 4a^4b^3) c^4 - 2(3a^4b^2 - 14a^2b^3 + 4b^5) \\
 & * c^3 + 4(2a^3b^3 - 3a^4b^5) c^2 - (4a^4c^9 + (8a^2 - b^2) c^8 + 2(2a^3 - \\
 & 3a^2b^2) c^7 - (a^2b^2 - b^4) c^6) \sqrt{(b^{10} - 8a^2b^8c + 36a^4b^2c^7 \\
 & + 9b^2c^8 + 18(3a^2b^2 - b^4) c^6 + 12(3a^3b^2 - 5a^4b^4) c^5 + 3 \\
 & * (3a^4b^2 - 22a^2b^4 + 5b^6) c^4 - 12(2a^3b^4 - 3a^4b^6) c^3 + 2(1 \\
 & 1a^2b^6 - 3b^8) c^2) / (b^2c^{12} - 4a^2c^{13}))} \cos(x) - 2(a^2b^5 - b^7) c \\
 & - 1/2 \sqrt{2} ((b^4c^7 - 6a^2b^2c^8 + 8a^4c^{10} + 2(4a^2 - b^2) c^9) \sqrt{(b^{10} - 8a^2b^8c + 36a^4b^2c^7 + 9b^2c^8 + 18(3a^2b^2 - b^4) c^6 + 12(3a^3b^2 - 5a^4b^4) \\
 & * c^5 + 3(3a^4b^2 - 22a^2b^4 + 5b^6) c^4 - 12(2a^3b^4 - 3a^4b^6) c^3 + 2(1 \\
 & 1a^2b^6 - 3b^8) c^2) / (b^2c^{12} - 4a^2c^{13}))} \sin(x) + (b^8c - 8a^2b^6c^2 - 12a^4b^2c^6 - 3(8a^2b^2 - b^4) c^5 \\
 & - 6(2a^3b^2 - 3a^4b^4) c^4 + (19a^2b^4 - 3b^6) c^3) \sin(x) \sqrt{-(b^6 - 6a^2b^4c - 6a^4c^5 - 2c^6 - 3(2a^2 - b^2) c^4 - 2(a^3 - 6a^2b^2) \\
 & * c^3 + 3(3a^2b^2 - b^4) c^2 - (b^2c^6 - 4a^4c^7) \sqrt{(b^{10} - 8a^2b^8c + 36a^4b^2c^7 + 9b^2c^8 + 18(3a^2b^2 - b^4) c^6 + 12(3a^3b^2 - 5a^4b^4) \\
 & * c^5 + 3(3a^4b^2 - 22a^2b^4 + 5b^6) c^4 - 12(2a^3b^4 - 3a^4b^6) c^3 + 2(11a^2b^6 - 3b^8) c^2) / (b^2c^{12} - 4a^2c^{13}))} / (b^2c^6 - 4 \\
 & * a^4c^7)) - (a^2b^6 - b^8 + 12a^2b^2c^5 + 3b^2c^6 + 6(3a^2b^2 - b^4) c^4
 \end{aligned}$$

$$^4 + 4*(3*a^3*b^2 - 4*a*b^4)*c^3 + (3*a^4*b^2 - 14*a^2*b^4 + 4*b^6)*c^2 - 2*(2*a^3*b^4 - 3*a*b^6)*c*\cos(x) + 2*(2*b^2 - 2*a*c - 3*c^2)*x + 2*(c^2*\cos(x) - 2*b*c)*\sin(x))/c^3$$

**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(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]  $\frac{1}{c^3} \frac{a}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \arctan\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) + \frac{b^3-2/c^2 a}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) + \frac{b+2/c}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) + \frac{a^2+1/c^3}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \arctan\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) + \frac{b^3+1/c^2}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) + \frac{a^2+2/c a}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) + \frac{1}{c^2} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \arctan\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) - \frac{2/c b}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) - \frac{2/c b}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) + \frac{b}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \arctan\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) + \frac{4a}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) - \frac{b}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) + \frac{4a}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) - \frac{2/c^2}{(\tan(1/2x)^2+1)^2} \frac{b-2/c}{\tan(1/2x)^3} + \frac{b+2/c}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) - \frac{2/c}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) + \frac{1}{c^3} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) + \frac{b^3-1/c^3 a}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) + \frac{b^2+1/c^3}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) + \frac{b^4-1/c^3}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) + \frac{b^4-3/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) + \frac{a^2 b+4/c^2 a}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) - \frac{b^2-4/c^2 a}{(-4ac+b^2)^{1/2}} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right)$

$$(-4ac+b^2)^{1/2}(-a+c)(a-b+c)^{1/2} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}}\right) + b^2-2/c^2a/(-4ac+b^2)^{1/2} / \left(\frac{(-4ac+b^2)^{1/2}+a-c}{(-4ac+b^2)^{1/2}-a+c}\right) (a-b+c)^{1/2} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}}\right) + b+3/c^2/(-4ac+b^2)^{1/2} / \left(\frac{(-4ac+b^2)^{1/2}-a+c}{(-4ac+b^2)^{1/2}-a+c}\right) (a-b+c)^{1/2} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}}\right) + a^2b+2/c^2a/(-4ac+b^2)^{1/2} / \left(\frac{(-4ac+b^2)^{1/2}-a+c}{(-4ac+b^2)^{1/2}-a+c}\right) (a-b+c)^{1/2} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}}\right) + b-1/c^3a/(-4ac+b^2)^{1/2} / \left(\frac{(-4ac+b^2)^{1/2}-a+c}{(-4ac+b^2)^{1/2}-a+c}\right) (a-b+c)^{1/2} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}}\right) + b^3-3/c^2 \operatorname{arctan}(\tan(1/2x)) + 1 / \left(\frac{(-4ac+b^2)^{1/2}-a+c}{(-4ac+b^2)^{1/2}-a+c}\right) (a-b+c)^{1/2} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}}\right) + 1 / \left(\frac{(-4ac+b^2)^{1/2}+a-c}{(-4ac+b^2)^{1/2}+a-c}\right) (a-b+c)^{1/2} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}}\right) + 2/c / (-4ac+b^2)^{1/2} / \left(\frac{(-4ac+b^2)^{1/2}+a-c}{(-4ac+b^2)^{1/2}+a-c}\right) (a-b+c)^{1/2} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}}\right) + b^2-2/c^2a / \left(\frac{(-4ac+b^2)^{1/2}+a-c}{(-4ac+b^2)^{1/2}+a-c}\right) (a-b+c)^{1/2} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}}\right) + b-2/c / (-4ac+b^2)^{1/2} / \left(\frac{(-4ac+b^2)^{1/2}+a-c}{(-4ac+b^2)^{1/2}+a-c}\right) (a-b+c)^{1/2} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}}\right) + a^2-1/c / (\tan(1/2x)^2+1)^2 \tan(1/2x)^3 + 1/c / (\tan(1/2x)^2+1)^2 \tan(1/2x) - 2/c^2 \operatorname{arctan}(\tan(1/2x)) + a^2/c^3 \operatorname{arctan}(\tan(1/2x)) + b^2-2/c / (-4ac+b^2)^{1/2} / \left(\frac{(-4ac+b^2)^{1/2}-a+c}{(-4ac+b^2)^{1/2}-a+c}\right) (a-b+c)^{1/2} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}}\right) + b^2-1/c^3a / \left(\frac{(-4ac+b^2)^{1/2}+a-c}{(-4ac+b^2)^{1/2}+a-c}\right) (a-b+c)^{1/2} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}}\right) + 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]  $\frac{1}{4} * (4c^3 * \operatorname{integrate}(-2*(2*(b^4 - 2ab^2c - 2b^2c^2) * \cos(3x))^2 + 4*(2*a^2b^2 - 5a^2c^2 - 4ac^3 - c^4 - (2a^3 - ab^2)c) * \cos(2x))^2 + 2*(b^4 - 2ab^2c - 2b^2c^2) * \cos(x))^2 + 2*(b^4 - 2ab^2c - 2b^2c^2) * \sin(3x))^2 + 4*(2a^2b^2 - 5a^2c^2 - 4ac^3 - c^4 - (2a^3 - ab^2)c) * \sin(2x))^2 + 2*(4ab^3 - 10ab^2c - 4b^2c^2 - 4b^2c^3 - (6a^2b - b^3)c) * \sin(2x) * \sin(x) + 2*(b^4 - 2ab^2c - 2b^2c^2) * \sin(x))^2 + ((b^3c - 2ab^2c^2 - 2b^2c^3) * \cos(3x) + 2*(ab^2c - a^2c^2 - 2ac^3 - c^4) * \cos(2x) + (b^3c - 2ab^2c^2 - 2b^2c^3) * \cos(x)) * \cos(4x) + (b^3c - 2ab^2c^2 - 2b^2c^3 + 2*(4ab^3 - 10ab^2c - 4b^2c^2 - 4b^2c^3 - (6a^2b - b^3)c) * \cos(2x) + 4*(b^4 - 2ab^2c - 2b^2c^2) * \cos(x)) * \cos(3x) + 2*(ab^2c - a^2c^2 - 2ac^3 - c^4 + (4ab^3 - 10ab^2c - 4b^2c^2 - 4b^2c^3 - (6a^2b - b^3)c) * \cos(x)) * \cos(2x) + (b^3c - 2ab^2c^2 - 2b^2c^3) * \cos(x) + ((b^3c - 2ab^2c^2 - 2b^2c^3) * \sin(3x) + 2*(ab^2c - a^2c^2 - 2ac^3 - c^4) * \sin(2x) + (b^3c - 2ab^2c^2 - 2b^2c^3) * \sin(x)) * \sin(4x) + 2*((4ab^3 - 10ab^2c - 4b^2c^2 - 4b^2c^3 - (6a^2b - b^3)c) * \sin(2x) + 2*(b^4 - 2ab^2c - 2b^2c^2) * \sin(x)) * \sin(3x)) / (c^5 * \cos(4x))^2 + 4b^2c^3 * \cos(3x))^2 + 4b^2c^3 * \cos(x))^2 + c^5 * \sin(4x))^2 + 4b^2c^3 * \sin(3x))^2 + 4b^2c^3 * \sin(x))^2 + 4b^2c^4 * \cos(x) + c^5 + 4*(4a^2c^3 + 4ac^4 + c^5) * \cos(2x))^2 + 4*(4a^2c^3 + 4ac^4 + c^5) * \sin(2x))^2 + 8*(2ab^2c^3 + b^2c^4) * \sin(2x) * \sin(x) + 2*(2b^2c^4 * \cos(3x) + 2b^2c^4 * \cos(x) + c^5 + 2*(2ac^4 + c^5) * \cos(2x)) * \cos(4x) + 4*(2b^2c^3 * \cos(x) + b^2c^4 + 2*(2ab^2c^3 + b^2c^4) * \cos(2x)) * \cos(3x) + 4*(2ac^4 + c^5 + 2*(2ab^2c^3 + b^2c^4) * \cos(x)) * \cos(2x) + 4*(b^2c^4 * \sin(3x) + b^2c^4 * \sin(x) + (2ac^4 + c^5) * \sin(2x)) * \sin(4x) + 8*(b^2c^3 * \sin(x) + (2ab^2c^3 + b^2c^4) * \sin(2x)) * \sin(3x)), x) + c^2 * \sin(2x) - 4b^2c * \sin(x) + 2*(2b^2 - 2ac - 3c^2) * x) / c^3$

**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]  $\text{int}(\sin(x)^4/(a + b\cos(x) + c\cos(x)^2), x)$

[Out]  $\text{atan}\left(\frac{\left(\left(\left(\left(2048(48ac^{15} + 272a^2c^{14} + 576a^3c^{13} + 576a^4c^{12} + 272a^5c^{11} + 48a^6c^{10} - 12b^2c^{14} + 20b^3c^{13} + 18b^4c^{12} - 46b^5c^{11} + 6b^6c^{10} + 26b^7c^9 - 12b^8c^8 - 140ab^2c^{13} + 288aab^3c^{12} + 30ab^4c^{11} - 240aab^5c^{10} + 74ab^6c^9 + 20ab^7c^8 - 416a^2b^2c^{13} - 736a^3b^2c^{12} - 544a^4b^2c^{11} - 144a^5b^2c^{10} - 360a^2b^2c^{12} + 728a^2b^3c^{11} - 50a^2b^4c^{10} - 182a^2b^5c^9 + 4a^2b^6c^8 - 360a^3b^2c^{11} + 544a^3b^3c^{10} + 10a^3b^4c^9 - 20a^3b^5c^8 - 172a^4b^2c^{10} + 116a^4b^3c^9 + 8a^4b^4c^8 - 44a^5b^2c^9 - 80aab^2c^{14}\right)/c^8 - (2048\tan(x/2)*(-8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5*(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^2c^4*(-4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2*(-4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2*(-4ac - b^2)^3)^{1/2} + 6ab^3c^3*(-4ac - b^2)^3)^{1/2} - 4ab^3c*(-4ac - b^2)^3)^{1/2}\right)/(2(16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2}*(32a^16c^{16} - 64a^2c^{15} - 128a^3c^{14} + 64a^4c^{13} + 96a^5c^{12} - 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144ab^2c^{14} - 200ab^3c^{13} + 184ab^4c^{12} - 56ab^5c^{11} - 8ab^6c^{10} + 288a^2b^2c^{14} + 352a^3b^2c^{13} - 32a^4b^2c^{12} - 320a^2b^2c^{13} + 8a^2b^3c^{12} + 96a^2b^4c^{11} - 8a^2b^5c^{10} - 272a^3b^2c^{12} + 40a^3b^3c^{11} + 8a^3b^4c^{10} - 56a^4b^2c^{11} - 96aab^2c^{15})/c^8)*(-8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5*(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^2c^4*(-4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2*(-4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2*(-4ac - b^2)^3)^{1/2} + 6ab^3c^3*(-4ac - b^2)^3)^{1/2} - 4ab^3c*(-4ac - b^2)^3)^{1/2}\right)/(2(16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2} + (2048\tan(x/2)*(24b^2c^{14} - 96a^2c^{14} - 8c^{15} + 152a^2c^{13} + 952a^3c^{12} + 1096a^4c^{11} + 304a^5c^{10} - 152a^6c^9 - 72a^7c^8 + 2b^2c^{13} - 38b^3c^{12} - 7b^4c^{11} + 39b^5c^{10} - 15b^6c^9 + 35b^7c^8 - 44b^8c^7 - 4b^9c^6 + 24b^{10}c^5 - 8b^{11}c^4 + 68ab^2c^{12} + 42ab^3c^{11} - 159ab^4c^{10} - 400ab^5c^9 + 537ab^6c^8 + 68ab^7c^7 - 276ab^8c^6 + 72ab^9c^5 + 8ab^{10}c^4 - 944a^2b^2c^{12} - 2520a^3b^2c^{11} - 1824a^4b^2c^{10} - 272a^5b^2c^9 + 88a^6b^2c^8 + 584a^2b^2c^{11} + 1742a^2b^3c^{10} - 1645a^2b^4c^9 - 795a^2b^5c^8 + 1132a^2b^6c^7 - 112a^2b^7c^6 - 112a^2b^8c^5 + 8a^2b^9c^4 + 476a^3b^2c^{10} + 2766a^3b^3c^9 - 1705a^3b^4c^8 - 396a^3b^5c^7 + 456a^3b^6c^6 - 56a^3b^7c^5 - 8a^3b^8c^4 + 230a^4b^2c^9 + 880a^4b^3c^8 - 656a^4b^4c^7 + 140a^4b^5c^6 + 72a^4b^6c^5 + 464a^5b^2c^8 - 192a^5b^3c^7 - 220a^5b^4c^6 + 256a^6b^2c^7 + 136aab^2c^{13}))/c^8)*(-8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5*(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^2c^4*(-4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2*(-4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2*(-4ac - b^2)^3)^{1/2} + 6ab^3c^3*(-4ac - b^2)^3)^{1/2} - 4ab^3c*(-4ac - b^2)^3)^{1/2}\right)/(2(16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2} + (2048*(236a^13c^{13} - 32b^2c^{13} + 12c^{14} + 1084a^2c^{12} + 2328a^3c^{11} + 2784a^4c^{10} + 1948a^5c^9 + 780a^6c^8 + 160a^7c^7 + 12a^8c^6 - 39b^2c^{12} + 121b^3c^{11} + 61b^4c^{10} - 220b^5c^9 - 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 635ab^2c^{11} + 1300ab^3c^{10} + 608ab^4c^9 - 1792ab^5c^8 - 60ab^6c^7 + 1218ab^7c^6 - 249ab^8c^5 - 340ab^9c^4 + 98ab^{10}c^3 + 20ab^{11}c^2 - 1616a^2b^2c^{11} - 3160a^3b^2c^{10} - 3440a^4b^2c^9 - 2132a^5b^2c^8 - 704a^6b^2c^7 - 96a^7b^2c^6 - 2242a^2b^2c^{10} + 4146a^2b^3c^9 + 1420a^2b^4c^8 - 4158a^2b^5c^7 + 77a^2b^6c^6 + 1735a^2b^7c^5 - 234a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 - 3714a^3b^2c^9 + 6252a^3b^3c^8 + 1730a^3b^4c^7 - 4300a^3b^5c^6 - 79a^3b^6c^5$





$$\begin{aligned}
& b^3c^2(-4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3)^{1/2} + 6ab^3c^3(-4ac - b^2)^3)^{1/2} - 4ab^3c^3(-4ac - b^2)^3)^{1/2} / (2(16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2} - (2048 \tan(x/2) * \\
& (24b^2c^{14} - 96a^2c^{14} - 8c^{15} + 152a^2c^{13} + 952a^3c^{12} + 1096a^4c^{11} + 304a^5c^{10} - 152a^6c^9 - 72a^7c^8 + 2b^2c^{13} - 38b^3c^{12} - 7 \\
& * b^4c^{11} + 39b^5c^{10} - 15b^6c^9 + 35b^7c^8 - 44b^8c^7 - 4b^9c^6 \\
& + 24b^{10}c^5 - 8b^{11}c^4 + 68ab^2c^{12} + 42ab^3c^{11} - 159ab^4c^{10} \\
& - 400ab^5c^9 + 537ab^6c^8 + 68ab^7c^7 - 276ab^8c^6 + 72ab^9c^5 \\
& + 8ab^{10}c^4 - 944a^2b^2c^{12} - 2520a^3b^2c^{11} - 1824a^4b^2c^{10} - 2 \\
& 72a^5b^2c^9 + 88a^6b^2c^8 + 584a^2b^2c^{11} + 1742a^2b^3c^{10} - 1645a^2 \\
& b^4c^9 - 795a^2b^5c^8 + 1132a^2b^6c^7 - 112a^2b^7c^6 - 112a^2 \\
& b^8c^5 + 8a^2b^9c^4 + 476a^3b^2c^{10} + 2766a^3b^3c^9 - 1705a^3b^4 \\
& c^8 - 396a^3b^5c^7 + 456a^3b^6c^6 - 56a^3b^7c^5 - 8a^3b^8c^4 \\
& + 230a^4b^2c^9 + 880a^4b^3c^8 - 656a^4b^4c^7 + 140a^4b^5c^6 + \\
& 72a^4b^6c^5 + 464a^5b^2c^8 - 192a^5b^3c^7 - 220a^5b^4c^6 + 256a^5 \\
& b^2c^7 + 136ab^2c^{13}) / c^8) * (-8ac^7 + b^8 + 24a^2c^6 + 24a^3c^5 \\
& + 8a^4c^4 + b^5(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6 \\
& c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^2c^4(-4ac - b^2)^3)^{1/2} - 54 \\
& a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(-4ac - b^2)^3)^{1/2} - 10 \\
& ab^6c + 3a^2b^2c^2(-4ac - b^2)^3)^{1/2} + 6ab^3c^3(-4ac - b^2)^3)^{1/2} - 4ab^3c^3(-4ac - b^2)^3)^{1/2} / (2(16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2} + (2048 * (236a^2c^{13} - 32b^2c^{13} + 12c^{14} \\
& + 1084a^2c^{12} + 2328a^3c^{11} + 2784a^4c^{10} + 1948a^5c^9 + 780a^6c^8 \\
& + 160a^7c^7 + 12a^8c^6 - 39b^2c^{12} + 121b^3c^{11} + 61b^4c^{10} - \\
& 220b^5c^9 - 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^{10} \\
& c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 635ab^2c^{11} + 1300ab^3c^{10} + 608ab^4 \\
& c^9 - 1792ab^5c^8 - 60ab^6c^7 + 1218ab^7c^6 - 249ab^8c^5 - \\
& 340ab^9c^4 + 98ab^{10}c^3 + 20ab^{11}c^2 - 1616a^2b^2c^{11} - 3160a^3 \\
& b^2c^{10} - 3440a^4b^2c^9 - 2132a^5b^2c^8 - 704a^6b^2c^7 - 96a^7b^2c^6 - \\
& 2242a^2b^2c^{10} + 4146a^2b^3c^9 + 1420a^2b^4c^8 - 4158a^2b^5c^7 \\
& + 77a^2b^6c^6 + 1735a^2b^7c^5 - 234a^2b^8c^4 - 222a^2b^9c^3 + 4 \\
& a^2b^{10}c^2 - 3714a^3b^2c^9 + 6252a^3b^3c^8 + 1730a^3b^4c^7 - 43 \\
& 00a^3b^5c^6 - 79a^3b^6c^5 + 968a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9 \\
& c^2 - 3523a^4b^2c^8 + 5025a^4b^3c^7 + 1339a^4b^4c^6 - 2082a^4b^5 \\
& c^5 - 192a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 2031a^5b^2 \\
& c^7 + 2104a^5b^3c^6 + 634a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 \\
& - 676a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 100a^7b^2c^5 - \\
& 404ab^2c^{12}) / c^8) * (-8ac^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 \\
& + b^5(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2 \\
& c^5 + 24ab^4c^3 + 3b^2c^4(-4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 \\
& + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(-4ac - b^2)^3)^{1/2} - 10 \\
& ab^6c + 3a^2b^2c^2(-4ac - b^2)^3)^{1/2} + 6ab^3c^3(-4ac - b^2)^3)^{1/2} - 4ab^3c^3(-4ac - b^2)^3)^{1/2} / (2(16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2} + (2048 \tan(x/2) * (20ab^{12} + 42a^2c^{12} - 58b^2c^{12} + \\
& 4b^{12}c - 4b^{13} + 22c^{13} - 40a^2b^{11} + 40a^3b^{10} - 20a^4b^9 + 4a^5 \\
& b^8 - 214a^2c^{11} - 938a^3c^{10} - 1538a^4c^9 - 1278a^5c^8 - 498a^6 \\
& c^7 - 14a^7c^6 + 52a^8c^5 + 12a^9c^4 + 14b^2c^{11} + 34b^3c^{10} + 5 \\
& 9b^4c^9 - 39b^5c^8 - 160b^6c^7 + 112b^7c^6 + 105b^8c^5 - 89b^9c^4 \\
& - 28b^{10}c^3 + 28b^{11}c^2 - 518ab^2c^{10} - 264ab^3c^9 + 1339ab^4 \\
& c^8 - 92ab^5c^7 - 1312ab^6c^6 + 268ab^7c^5 + 649ab^8c^4 - 124 \\
& ab^9c^3 - 180ab^{10}c^2 + 1550a^2b^2c^{10} - 160a^2b^{10}c + 3488a^3b^2 \\
& c^9 + 320a^3b^9c + 3350a^4b^2c^8 - 300a^4b^8c + 1092a^5b^2c^7 + 13 \\
& 6a^5b^7c - 462a^6b^2c^6 - 24a^6b^6c - 440a^7b^2c^5 - 92a^8b^2c^4 - \\
& 1568a^2b^2c^9 - 2708a^2b^3c^8 + 3564a^2b^4c^7 + 1964a^2b^5c^6 \\
& - 2790a^2b^6c^5 - 922a^2b^7c^4 + 1048a^2b^8c^3 + 276a^2b^9c^2 - \\
& 652a^3b^2c^8 - 6280a^3b^3c^7 + 2020a^3b^4c^6 + 4988a^3b^5c^5 - \\
& 1118a^3b^6c^4 - 2008a^3b^7c^3 + 140a^3b^8c^2 + 2350a^4b^2c^7 - \\
& 5630a^4b^3c^6 - 2295a^4b^4c^5 + 3563a^4b^5c^4 + 1260a^4b^6c^3 \\
& - 740a^4b^7c^2 + 3314a^5b^2c^6 - 1456a^5b^3c^5 - 2771a^5b^4c^4
\end{aligned}$$

$$\begin{aligned}
& + 308a^5b^5c^3 + 732a^5b^6c^2 + 1572a^6b^2c^5 + 576a^6b^3c^4 - \\
& 696a^6b^4c^3 - 300a^6b^5c^2 + 192a^7b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 148a^8b^3c^2 + 24a^8b^4c^1 + 24a^8b^5c^0 \\
& )/c^8 * (- (8a^8c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5 * (- (4a^2c^3 - b^2)^3)^{1/2} \\
& - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 + 3b^2c^4 * (- (4a^2c^3 - b^2)^3)^{1/2} \\
& - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} - 10a^2b^6c + 3a^2b^2c^2 * (- (4a^2c^3 \\
& - b^2)^3)^{1/2} + 6a^2b^3c^3 * (- (4a^2c^3 - b^2)^3)^{1/2} - 4a^2b^3c^4 * (- (4a^2c^3 - b^2)^3)^{1/2} \\
& )) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7))^{1/2} * i) / ((4096 * (16a^2b^11 + 274a^2c^11 - 78b^2c^11 + 4b^11c - 4b^12 + 33c^12 - 16a^2 \\
& * b^10 - 16a^3b^9 + 40a^4b^8 - 16a^5b^7 - 16a^6b^6 + 16a^7b^5 - 4a^8b^4 + 1008a^2c^10 + 2156a^3c^9 + 2954a^4c^8 + 2688a^5c^7 + 1624 \\
& * a^6c^6 + 628a^7c^5 + 141a^8c^4 + 14a^9c^3 - 64b^2c^10 + 268b^3c^9 - 26b^4c^8 - 348b^5c^7 + 144b^6c^6 + 208b^7c^5 - 123b^8c^4 - 5 \\
& 4b^9c^3 + 40b^10c^2 - 520a^2b^2c^9 + 1516a^2b^3c^8 + 144a^2b^4c^7 - 1564a^2b^5c^6 + 228a^2b^6c^5 + 740a^2b^7c^4 - 146a^2b^8c^3 - 164a^2b^9c^2 \\
& - 1624a^2b^2c^9 - 112a^2b^9c - 2676a^3b^2c^8 + 128a^3b^8c - 2588a^4b^2c^7 + 56a^4b^7c - 1388a^5b^2c^6 - 184a^5b^6c - 264a^6b^2c^5 \\
& + 80a^6b^5c + 116a^7b^2c^4 + 32a^7b^4c + 74a^8b^2c^3 - 28a^8b^3c^2 + 12a^9b^2c^2 + 4a^9b^2c - 1820a^2b^2c^8 + 3576a^2b^3c^7 + 1032 \\
& * a^2b^4c^6 - 2792a^2b^5c^5 - 236a^2b^6c^4 + 920a^2b^7c^3 + 64a^2b^8c^2 - 3584a^3b^2c^7 + 4472a^3b^3c^6 + 2236a^3b^4c^5 - 2436a^3b^5c^4 \\
& - 744a^3b^6c^3 + 464a^3b^7c^2 - 4336a^4b^2c^6 + 3040a^4b^3c^5 + 2390a^4b^4c^4 - 964a^4b^5c^3 - 592a^4b^6c^2 - 3284a^5b^2c^5 \\
& + 908a^5b^3c^4 + 1364a^5b^4c^3 - 40a^5b^5c^2 - 1500a^6b^2c^4 - 104a^6b^3c^3 + 384a^6b^4c^2 - 360a^7b^2c^3 - 144a^7b^3c^2 \\
& - 24a^8b^2c^2 - 544a^8b^2c^2 - 544a^8b^2c^2 + 20a^8b^10c)) / c^8 + (((((2048 * (48a^8c^15 + 272a^2c^14 + 576a^3c^13 + 576a^4c^12 + 272a^5c^11 + 48a^6c^10 \\
& - 12b^2c^14 + 20b^3c^13 + 18b^4c^12 - 46b^5c^11 + 6b^6c^10 + 26b^7c^9 - 12b^8c^8 - 140a^2b^2c^13 + 288a^2b^3c^12 + 30a^2b^4c^11 - \\
& 240a^2b^5c^10 + 74a^2b^6c^9 + 20a^2b^7c^8 - 416a^2b^2c^13 - 736a^3b^2c^12 - 544a^4b^2c^11 - 144a^5b^2c^10 - 360a^2b^2c^12 + 728a^2b^3c^11 \\
& - 50a^2b^4c^10 - 182a^2b^5c^9 + 4a^2b^6c^8 - 360a^3b^2c^11 + 544a^3b^3c^10 + 10a^3b^4c^9 - 20a^3b^5c^8 - 172a^4b^2c^10 + 116a^4b^3c^9 \\
& + 8a^4b^4c^8 - 44a^5b^2c^9 - 80a^2b^2c^14)) / c^8 - (2048 * tan(x/2) * (- (8a^8c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5 * (- (4a^2c^3 - b^2)^3)^{1/2} \\
& - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 + 3b^2c^4 * (- (4a^2c^3 - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 \\
& - 3b^3c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} - 10a^2b^6c + 3a^2b^2c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} + 6a^2b^3c^3 * (- (4a^2c^3 - b^2)^3)^{1/2} - 4a^2b^3c^4 \\
& * (- (4a^2c^3 - b^2)^3)^{1/2}))) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7))^{1/2} * (32a^2c^16 - 64a^2c^15 - 128a^3c^14 + 64a^4c^13 + 96a^5c^12 \\
& - 8b^2c^15 + 24b^3c^14 - 32b^4c^13 + 32b^5c^12 - 24b^6c^11 + 8b^7c^10 + 144a^2b^2c^14 - 200a^2b^3c^13 + 184a^2b^4c^12 - 56a^2b^5c^11 - \\
& 8a^2b^6c^10 + 288a^2b^2c^14 + 352a^3b^2c^13 - 32a^4b^2c^12 - 320a^2b^2c^13 + 8a^2b^3c^12 + 96a^2b^4c^11 - 8a^2b^5c^10 - 272a^3b^2c^12 \\
& + 40a^3b^3c^11 + 8a^3b^4c^10 - 56a^4b^2c^11 - 96a^2b^2c^15)) / c^8 * (- (8a^8c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5 * (- (4a^2c^3 - b^2)^3)^{1/2} \\
& - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 + 3b^2c^4 * (- (4a^2c^3 - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - \\
& 38a^3b^2c^3 - 3b^3c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} - 10a^2b^6c + 3a^2b^2c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} + 6a^2b^3c^3 * (- (4a^2c^3 - b^2)^3)^{1/2} - 4a^2b^3c^4 \\
& * (- (4a^2c^3 - b^2)^3)^{1/2}))) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7))^{1/2} + (2048 * tan(x/2) * (24b^2c^14 - 96a^2c^14 - 8c^15 + 152a^2c^13 + 952a^3c^12 \\
& + 1096a^4c^11 + 304a^5c^10 - 152a^6c^9 - 72a^7c^8 + 2b^2c^13 - 38b^3c^12 - 7b^4c^11 + 39b^5c^10 - 15b^6c^9 + 35b^7c^8 - 44b^8c^7 \\
& - 4b^9c^6 + 24b^10c^5 - 8b^11c^4 + 68a^2b^2c^12 + 42a^2b^3c^11 - 159a^2b^4c^10 - 400a^2b^5c^9 + 537a^2b^6c^8 + 68a^2b^7c^7 - 276a^2b^8c^6 \\
& + 72a^2b^9c^5 + 8a^2b^10c^4 - 944a^2b^2c^12 - 2520a^3b^2c^11 -
\end{aligned}$$

$$\begin{aligned}
& 1824a^4b^2c^{10} - 272a^5b^2c^9 + 88a^6b^2c^8 + 584a^2b^2c^{11} + 1742a^2b^3c^{10} - 1645a^2b^4c^9 - 795a^2b^5c^8 + 1132a^2b^6c^7 - 112a^2b^7c^6 - 112a^2b^8c^5 + 8a^2b^9c^4 + 476a^3b^2c^{10} + 2766a^3b^3c^9 - 1705a^3b^4c^8 - 396a^3b^5c^7 + 456a^3b^6c^6 - 56a^3b^7c^5 - 8a^3b^8c^4 + 230a^4b^2c^9 + 880a^4b^3c^8 - 656a^4b^4c^7 + 140a^4b^5c^6 + 72a^4b^6c^5 + 464a^5b^2c^8 - 192a^5b^3c^7 - 220a^5b^4c^6 + 256a^6b^2c^7 + 136a^6b^3c^6 + 136a^6b^4c^5 + 136a^6b^5c^4 + 136a^6b^6c^3 + 136a^6b^7c^2 + 136a^6b^8c^1 + 136a^6b^9c^0) / c^8 * (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5 * (- (4a^2c^2 - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 + 3b^2c^4 * (- (4a^2c^2 - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 * (- (4a^2c^2 - b^2)^3)^{1/2} - 10a^2b^6c + 3a^2b^2c^2 * (- (4a^2c^2 - b^2)^3)^{1/2} + 6a^2b^3c * (- (4a^2c^2 - b^2)^3)^{1/2} - 4a^2b^3c * (- (4a^2c^2 - b^2)^3)^{1/2} ) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7)))^{1/2} + (2048 * (236a^2c^13 - 32b^2c^13 + 12c^14 + 1084a^2c^12 + 2328a^3c^11 + 2784a^4c^10 + 1948a^5c^9 + 780a^6c^8 + 160a^7c^7 + 12a^8c^6 - 39b^2c^12 + 121b^3c^11 + 61b^4c^10 - 220b^5c^9 - 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^10c^4 + 26b^11c^3 - 12b^12c^2 - 635a^2b^2c^11 + 1300a^2b^3c^10 + 608a^2b^4c^9 - 1792a^2b^5c^8 - 60a^2b^6c^7 + 1218a^2b^7c^6 - 249a^2b^8c^5 - 340a^2b^9c^4 + 98a^2b^10c^3 + 20a^2b^11c^2 - 1616a^2b^12c^1 - 3160a^3b^2c^10 - 3440a^3b^3c^9 - 2132a^3b^4c^8 - 704a^3b^5c^7 - 96a^3b^6c^6 - 2242a^3b^7c^5 + 4146a^3b^8c^4 + 1420a^3b^9c^3 - 4158a^3b^10c^2 + 77a^3b^11c^1 - 234a^3b^12c^0 - 222a^4b^2c^9 + 4a^4b^3c^8 - 3714a^4b^4c^7 + 6252a^4b^5c^6 + 1730a^4b^6c^5 - 4300a^4b^7c^4 - 79a^4b^8c^3 + 968a^4b^9c^2 + 2a^4b^10c^1 - 20a^4b^11c^0 - 3523a^5b^2c^8 + 5025a^5b^3c^7 + 1339a^5b^4c^6 - 2082a^5b^5c^5 - 192a^5b^6c^4 + 156a^5b^7c^3 + 8a^5b^8c^2 - 2031a^5b^9c^1 + 2104a^5b^10c^0 + 634a^6b^2c^7 - 388a^6b^3c^6 - 60a^6b^4c^5 - 676a^6b^5c^4 + 364a^6b^6c^3 + 136a^6b^7c^2 - 100a^6b^8c^1 - 404a^6b^9c^0 + 404a^7b^2c^6 + 24a^7b^3c^5 + 8a^7b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 + 3b^2c^4 * (- (4a^2c^2 - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 * (- (4a^2c^2 - b^2)^3)^{1/2} - 10a^2b^6c + 3a^2b^2c^2 * (- (4a^2c^2 - b^2)^3)^{1/2} + 6a^2b^3c * (- (4a^2c^2 - b^2)^3)^{1/2} - 4a^2b^3c * (- (4a^2c^2 - b^2)^3)^{1/2} ) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7)))^{1/2} - (2048 * tan(x/2) * (20a^2b^12 + 42a^2b^11c - 20a^2b^10c^2 - 58b^2c^12 + 4b^12c - 4b^13 + 22c^13 - 40a^2b^11 + 40a^3b^10 - 20a^4b^9 + 4a^5b^8 - 214a^2c^11 - 938a^3c^10 - 1538a^4c^9 - 1278a^5c^8 - 498a^6c^7 - 14a^7c^6 + 52a^8c^5 + 12a^9c^4 + 14b^2c^11 + 34b^3c^10 + 59b^4c^9 - 39b^5c^8 - 160b^6c^7 + 112b^7c^6 + 105b^8c^5 - 89b^9c^4 - 28b^10c^3 + 28b^11c^2 - 518a^2b^2c^10 - 264a^2b^3c^9 + 1339a^2b^4c^8 - 92a^2b^5c^7 - 1312a^2b^6c^6 + 268a^2b^7c^5 + 649a^2b^8c^4 - 124a^2b^9c^3 - 180a^2b^10c^2 + 1550a^2b^11c^1 - 160a^2b^12c^0 + 3488a^3b^2c^9 + 320a^3b^3c^8 + 3350a^3b^4c^7 - 300a^3b^5c^6 + 1092a^3b^6c^5 + 136a^3b^7c^4 - 462a^3b^8c^3 - 24a^3b^9c^2 - 440a^3b^10c^1 + 1092a^3b^11c^0 - 1568a^4b^2c^8 - 2708a^4b^3c^7 + 3564a^4b^4c^6 + 1964a^4b^5c^5 - 2790a^4b^6c^4 - 922a^4b^7c^3 + 1048a^4b^8c^2 + 276a^4b^9c^1 - 652a^4b^10c^0 - 6280a^5b^2c^7 + 2020a^5b^3c^6 + 4988a^5b^4c^5 - 1118a^5b^5c^4 - 2008a^5b^6c^3 + 140a^5b^7c^2 + 2350a^5b^8c^1 - 5630a^5b^9c^0 - 2295a^6b^2c^6 + 3563a^6b^3c^5 + 1260a^6b^4c^4 - 740a^6b^5c^3 + 3314a^6b^6c^2 - 1456a^6b^7c^1 - 2771a^6b^8c^0 + 308a^7b^2c^5 + 732a^7b^3c^4 + 1572a^7b^4c^3 + 576a^7b^5c^2 - 696a^7b^6c^1 - 300a^7b^7c^0 + 192a^8b^2c^4 + 72a^8b^3c^3 + 44a^8b^4c^2 - 32a^8b^5c^1 + 148a^8b^6c^0 + 24a^8b^7c^0) / c^8 * (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5 * (- (4a^2c^2 - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 + 3b^2c^4 * (- (4a^2c^2 - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 * (- (4a^2c^2 - b^2)^3)^{1/2} - 10a^2b^6c + 3a^2b^2c^2 * (- (4a^2c^2 - b^2)^3)^{1/2} + 6a^2b^3c * (- (4a^2c^2 - b^2)^3)^{1/2} - 4a^2b^3c * (- (4a^2c^2 - b^2)^3)^{1/2} ) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7)))^{1/2}
\end{aligned}$$

$$\begin{aligned}
& \left. \right)^{(1/2)} + \left( \left( \left( \left( 2048(48a^4c^{15} + 272a^5c^{14} + 576a^6c^{13} + 576a^7c^{12} + 272a^8c^{11} + 48a^9c^{10} - 12b^2c^{14} + 20b^3c^{13} + 18b^4c^{12} - \right. \right. \right. \right. \\
& 46b^5c^{11} + 6b^6c^{10} + 26b^7c^9 - 12b^8c^8 - 140a^2b^2c^{13} + 288a^3b^3c^{12} + 30a^4b^4c^{11} - 240a^5b^5c^{10} + 74a^6b^6c^9 + 20a^7b^7c^8 - \\
& 416a^8b^8c^7 - 736a^9b^9c^6 - 544a^{10}b^{10}c^5 - 144a^{11}b^{11}c^4 - 360a^{12}b^{12}c^3 + 728a^{13}b^{13}c^2 - 50a^{14}b^{14}c - 182a^{15}b^{15} \\
& + 4a^{16}b^{16} - 360a^{17}b^{17}c + 544a^{18}b^{18}c^2 + 10a^{19}b^{19}c^3 - 20a^{20}b^{20}c^4 - 172a^{21}b^{21}c^5 - 80a^{22}b^{22}c^6 - \\
& 80a^{23}b^{23}c^7 + 8a^{24}b^{24}c^8 - 44a^{25}b^{25}c^9 - 80a^{26}b^{26}c^{10} \left. \right) \right) / c^8 + (2048 \tan(x/2) \left( - (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + \right. \\
& 8a^4c^4 + b^5 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^3b^3c^4 + 3b^5c^4 \left( - (4ac - b^2)^3 \right)^{(1/2)} - \\
& 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 10a^2b^6c + 3a^2b^8c^2 \left( - (4ac - b^2)^3 \right)^{(1/2)} + 6a^2b^8c^3 \left( - (4ac - b^2)^3 \right)^{(1/2)} - \\
& 4a^2b^8c^3 \left( - (4ac - b^2)^3 \right)^{(1/2)} \left. \right) \right) / (2(16a^2c^8 + b^4c^6 - 8a^2b^2c^7)) \left. \right)^{(1/2)} * (32a^{16}c^{16} - 64a^{15}c^{15} - 128a^{14}c^{14} + 64a^{13}c^{13} + 96a^{12}c^{12} - 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144a^2b^2c^{14} - 200a^3b^3c^{13} + 184a^4b^4c^{12} - 56a^5b^5c^{11} - 8a^6b^6c^{10} + 288a^7b^7c^9 + 352a^8b^8c^8 - 32a^9b^9c^7 - 320a^{10}b^{10}c^6 + 8a^{11}b^{11}c^5 + 96a^{12}b^{12}c^4 - 8a^{13}b^{13}c^3 - 272a^{14}b^{14}c^2 + 40a^{15}b^{15}c - 56a^{16}b^{16} \\
& - 96a^{17}b^{17}c + 15) / c^8) \left( - (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^3b^3c^4 + 3b^5c^4 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 10a^2b^6c + 3a^2b^8c^2 \left( - (4ac - b^2)^3 \right)^{(1/2)} + 6a^2b^8c^3 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 4a^2b^8c^3 \left( - (4ac - b^2)^3 \right)^{(1/2)} \right) \left. \right) \right) / (2(16a^2c^8 + b^4c^6 - 8a^2b^2c^7)) \left. \right)^{(1/2)} - (2048 \tan(x/2) \left( 24b^4c^{14} - 96a^4c^{14} - 8a^5c^{15} + 152a^6c^{13} + 952a^7c^{12} + 1096a^8c^{11} + 304a^9c^{10} - 152a^{10}c^9 - 72a^{11}c^8 + 2b^2c^{13} - 38b^3c^{12} - 7b^4c^{11} + 39b^5c^{10} - 15b^6c^9 + 35b^7c^8 - 44b^8c^7 - 4b^9c^6 + 24b^{10}c^5 - 8b^{11}c^4 + 68a^2b^2c^{12} + 42a^3b^3c^{11} - 159a^4b^4c^{10} - 400a^5b^5c^9 + 537a^6b^6c^8 + 68a^7b^7c^7 - 276a^8b^8c^6 + 72a^9b^9c^5 + 8a^{10}b^{10}c^4 - 944a^{11}b^{11}c^3 - 2520a^{12}b^{12}c^2 - 1824a^{13}b^{13}c - 272a^{14}b^{14}c + 88a^{15}b^{15}c - 88a^{16}b^{16}c + 584a^{17}b^{17}c - 1742a^{18}b^{18}c + 1645a^{19}b^{19}c - 795a^{20}b^{20}c + 1132a^{21}b^{21}c - 112a^{22}b^{22}c + 8a^{23}b^{23}c + 476a^{24}b^{24}c - 396a^{25}b^{25}c + 456a^{26}b^{26}c - 56a^{27}b^{27}c - 8a^{28}b^{28}c + 230a^{29}b^{29}c + 880a^{30}b^{30}c - 656a^{31}b^{31}c + 140a^{32}b^{32}c + 72a^{33}b^{33}c + 464a^{34}b^{34}c - 192a^{35}b^{35}c - 220a^{36}b^{36}c + 256a^{37}b^{37}c + 136a^{38}b^{38}c \left. \right) \right) / c^8) \left( - (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^3b^3c^4 + 3b^5c^4 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 10a^2b^6c + 3a^2b^8c^2 \left( - (4ac - b^2)^3 \right)^{(1/2)} + 6a^2b^8c^3 \left( - (4ac - b^2)^3 \right)^{(1/2)} - 4a^2b^8c^3 \left( - (4ac - b^2)^3 \right)^{(1/2)} \right) \left. \right) \right) / (2(16a^2c^8 + b^4c^6 - 8a^2b^2c^7)) \left. \right)^{(1/2)} + (2048(236a^{13}c^{13} - 32b^4c^{13} + 12c^{14} + 1084a^2c^{12} + 2328a^3c^{11} + 2784a^4c^{10} + 1948a^5c^9 + 780a^6c^8 + 160a^7c^7 + 12a^8c^6 - 39b^2c^{12} + 121b^3c^{11} + 61b^4c^{10} - 220b^5c^9 - 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 635a^2b^2c^{11} + 1300a^3b^3c^{10} + 608a^4b^4c^9 - 1792a^5b^5c^8 - 60a^6b^6c^7 + 1218a^7b^7c^6 - 249a^8b^8c^5 - 340a^9b^9c^4 + 98a^{10}b^{10}c^3 + 20a^{11}b^{11}c^2 - 1616a^{12}b^{12}c - 3160a^{13}b^{13}c + 3440a^{14}b^{14}c - 2132a^{15}b^{15}c - 704a^{16}b^{16}c - 96a^{17}b^{17}c - 2242a^{18}b^{18}c + 4146a^{19}b^{19}c + 1420a^{20}b^{20}c - 4158a^{21}b^{21}c + 77a^{22}b^{22}c + 1735a^{23}b^{23}c - 234a^{24}b^{24}c - 222a^{25}b^{25}c + 4a^{26}b^{26}c - 3714a^{27}b^{27}c - 6252a^{28}b^{28}c + 1730a^{29}b^{29}c - 4300a^{30}b^{30}c - 79a^{31}b^{31}c - 968a^{32}b^{32}c + 2a^{33}b^{33}c - 20a^{34}b^{34}c - 3523a^{35}b^{35}c + 5025a^{36}b^{36}c + 1339a^{37}b^{37}c - 2082a^{38}b^{38}c - 192a^{39}b^{39}c + 156a^{40}b^{40}c + 8a^{41}b^{41}c + 2031a^{42}b^{42}c + 2104a^{43}b^{43}c +
\end{aligned}$$

$$\begin{aligned}
& 634a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 676a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 100a^7b^2c^5 - 404ab^6c^{12})/c^8) \cdot (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^6c^4(-4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(-4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3)^{1/2} + 6ab^3c^3(-4ac - b^2)^3)^{1/2} - 4ab^3c^3(-4ac - b^2)^3)^{1/2})/(2(16a^2c^8 + b^4c^6 - 8ab^2c^7)))^{1/2} + (2048 \tan(x/2)(20ab^{12} + 42a^2c^{12} - 58b^2c^{12} + 4b^{12}c - 4b^{13} + 22c^{13} - 40a^2b^{11} + 40a^3b^{10} - 20a^4b^9 + 4a^5b^8 - 214a^2c^{11} - 938a^3c^{10} - 1538a^4c^9 - 1278a^5c^8 - 498a^6c^7 - 14a^7c^6 + 52a^8c^5 + 12a^9c^4 + 14b^2c^{11} + 34b^3c^{10} + 59b^4c^9 - 39b^5c^8 - 160b^6c^7 + 112b^7c^6 + 105b^8c^5 - 89b^9c^4 - 28b^{10}c^3 + 28b^{11}c^2 - 518ab^2c^{10} - 264ab^3c^9 + 1339ab^4c^8 - 92ab^5c^7 - 1312ab^6c^6 + 268ab^7c^5 + 649ab^8c^4 - 124ab^9c^3 - 180ab^{10}c^2 + 1550a^2b^2c^{10} - 160a^2b^{10}c + 3488a^3b^2c^9 + 320a^3b^9c + 3350a^4b^2c^8 - 300a^4b^8c + 1092a^5b^2c^7 + 136a^5b^7c - 462a^6b^2c^6 - 24a^6b^6c - 440a^7b^2c^5 - 92a^8b^2c^4 - 1568a^2b^2c^9 - 2708a^2b^3c^8 + 3564a^2b^4c^7 + 1964a^2b^5c^6 - 2790a^2b^6c^5 - 922a^2b^7c^4 + 1048a^2b^8c^3 + 276a^2b^9c^2 - 652a^3b^2c^8 - 6280a^3b^3c^7 + 2020a^3b^4c^6 + 4988a^3b^5c^5 - 1118a^3b^6c^4 - 2008a^3b^7c^3 + 140a^3b^8c^2 + 2350a^4b^2c^7 - 5630a^4b^3c^6 - 2295a^4b^4c^5 + 3563a^4b^5c^4 + 1260a^4b^6c^3 - 740a^4b^7c^2 + 3314a^5b^2c^6 - 1456a^5b^3c^5 - 2771a^5b^4c^4 + 308a^5b^5c^3 + 732a^5b^6c^2 + 1572a^6b^2c^5 + 576a^6b^3c^4 - 696a^6b^4c^3 - 300a^6b^5c^2 + 192a^7b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 148ab^6c^{11} + 24ab^{11}c))/c^8) \cdot (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^6c^4(-4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(-4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3)^{1/2} + 6ab^3c^3(-4ac - b^2)^3)^{1/2} - 4ab^3c^3(-4ac - b^2)^3)^{1/2})/(2(16a^2c^8 + b^4c^6 - 8ab^2c^7)))^{1/2})) \cdot (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^6c^4(-4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(-4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3)^{1/2} + 6ab^3c^3(-4ac - b^2)^3)^{1/2} - 4ab^3c^3(-4ac - b^2)^3)^{1/2})/(2(16a^2c^8 + b^4c^6 - 8ab^2c^7)))^{1/2}) \cdot 2i - ((\tan(x/2)(2b - c))/c^2 + (\tan(x/2)^3(2b + c))/c^2)/(2 \tan(x/2)^2 + \tan(x/2)^4 + 1) + \operatorname{atan}(((((((2048(48a^8c^{15} + 272a^2c^{14} + 576a^3c^{13} + 576a^4c^{12} + 272a^5c^{11} + 48a^6c^{10} - 12b^2c^{14} + 20b^3c^{13} + 18b^4c^{12} - 46b^5c^{11} + 6b^6c^{10} + 26b^7c^9 - 12b^8c^8 - 140ab^2c^{13} + 288ab^3c^{12} + 30ab^4c^{11} - 240ab^5c^{10} + 74ab^6c^9 + 20ab^7c^8 - 416a^2b^2c^{13} - 736a^3b^2c^{12} - 544a^4b^2c^{11} - 144a^5b^2c^{10} - 360a^2b^2c^{12} + 728a^2b^3c^{11} - 50a^2b^4c^{10} - 182a^2b^5c^9 + 4a^2b^6c^8 - 360a^3b^2c^{11} + 544a^3b^3c^{10} + 10a^3b^4c^9 - 20a^3b^5c^8 - 172a^4b^2c^{10} + 116a^4b^3c^9 + 8a^4b^4c^8 - 44a^5b^2c^9 - 80ab^6c^{14}))/c^8 - (2048 \tan(x/2)(- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5(-4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 - 3b^6c^4(-4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2(-4ac - b^2)^3)^{1/2} - 10ab^6c - 3a^2b^2c^2(-4ac - b^2)^3)^{1/2} - 6ab^3c^3(-4ac - b^2)^3)^{1/2} + 4ab^3c^3(-4ac - b^2)^3)^{1/2})/(2(16a^2c^8 + b^4c^6 - 8ab^2c^7)))^{1/2})(32a^2c^{16} - 64a^2c^{15} - 128a^3c^{14} + 64a^4c^{13} + 96a^5c^{12} - 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144ab^2c^{14} - 200ab^3c^{13} + 184ab^4c^{12} - 56ab^5c^{11} - 8ab^6c^{10} + 288a^2b^2c^{14} + 352a^3b^2c^{13} - 32a^4b^2c^{12} - 320a^2b^2c^{13} + 8a^2b^3c^{12} + 96a^2b^4c^{11} - 8a^2b^5c^{10} - 272a^
\end{aligned}$$

$$\begin{aligned}
& a^3b^2c^{12} + 40a^3b^3c^{11} + 8a^3b^4c^{10} - 56a^4b^2c^{11} - 96a^4b^3c^{10} - 96a^4b^4c^9 \\
& - 40a^4b^5c^8 - 40a^4b^6c^7 - 40a^4b^7c^6 - 40a^4b^8c^5 - 40a^4b^9c^4 - 40a^4b^{10}c^3 - 40a^4b^{11}c^2 - 40a^4b^{12}c \\
& - 40a^4b^{13} - 40a^4b^{14} - 40a^4b^{15})/c^8 * (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- \\
& (4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 - 3b^2c^4 * (- (4ac - b^2)^3)^{1/2} \\
& - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (- (4ac - b^2)^3)^{1/2} - 10ab^6c - 3a^2b^2c^2 * (- (4ac - b^2)^3)^{1/2} \\
& - 6ab^3c^3 * (- (4ac - b^2)^3)^{1/2} + 4ab^3c * (- (4ac - b^2)^3)^{1/2}) / (2 * (16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2} + (2048 * \tan(x/2) * (24b^14c^{14} - 96a^14c^{14} - 8c^{15} + 152a^2c^{13} \\
& + 952a^3c^{12} + 1096a^4c^{11} + 304a^5c^{10} - 152a^6c^9 - 72a^7c^8 + 2b^2c^{13} - 38b^3c^{12} - 7b^4c^{11} + 39b^5c^{10} - 15b^6c^9 + 35b^7c^8 - 44b^8c^7 \\
& - 4b^9c^6 + 24b^{10}c^5 - 8b^{11}c^4 + 68ab^2c^{12} + 42ab^3c^{11} - 159ab^4c^{10} - 400ab^5c^9 + 537ab^6c^8 + 68ab^7c^7 - 276ab^8c^6 + 72ab^9c^5 + 8ab^{10}c^4 - 944a^2b^12c^{12} \\
& - 2520a^3b^11c^{11} - 1824a^4b^10c^{10} - 272a^5b^9c^9 + 88a^6b^8c^8 + 584a^2b^2c^{11} + 1742a^2b^3c^{10} - 1645a^2b^4c^9 - 795a^2b^5c^8 + 1132a^2b^6c^7 - 112a^2b^7c^6 \\
& - 112a^2b^8c^5 + 8a^2b^9c^4 + 476a^3b^2c^{10} + 2766a^3b^3c^9 - 1705a^3b^4c^8 - 396a^3b^5c^7 + 456a^3b^6c^6 - 56a^3b^7c^5 - 8a^3b^8c^4 + 230a^4b^2c^9 + 880a^4b^3c^8 - 656a^4 \\
& b^4c^7 + 140a^4b^5c^6 + 72a^4b^6c^5 + 464a^5b^2c^8 - 192a^5b^3c^7 - 220a^5b^4c^6 + 256a^6b^2c^7 + 136ab^13c^8) / c^8 * (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- \\
& (4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 - 3b^2c^4 * (- (4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 \\
& + 3b^3c^2 * (- (4ac - b^2)^3)^{1/2} - 10ab^6c - 3a^2b^2c^2 * (- (4ac - b^2)^3)^{1/2} - 6ab^3c^3 * (- (4ac - b^2)^3)^{1/2} + 4ab^3c * (- (4ac - b^2)^3)^{1/2}) / (2 * (16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2} \\
& + (2048 * (236a^13c^{13} - 32b^13c^{13} + 12c^{14} + 1084a^2c^{12} + 2328a^3c^{11} + 2784a^4c^{10} + 1948a^5c^9 + 780a^6c^8 + 160a^7c^7 + 12a^8c^6 - 39b^2c^{12} + 121b^3c^{11} \\
& + 61b^4c^{10} - 220b^5c^9 - 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 635ab^2c^{11} + 1300a^2b^3c^{10} + 608a^2b^4c^9 - 1792a^2b^5c^8 - 60a^2b^6c^7 + 121 \\
& 8a^2b^7c^6 - 249a^2b^8c^5 - 340a^2b^9c^4 + 98a^2b^{10}c^3 + 20a^2b^{11}c^2 - 1616a^2b^11c^{11} - 3160a^3b^10c^{10} - 3440a^4b^9c^9 - 2132a^5b^8c^8 - 704a^6b^7c^7 - 96a^7b^6c^6 - 2242a^2b^2c^{10} \\
& + 4146a^2b^3c^9 + 1420a^2b^4c^8 - 4158a^2b^5c^7 + 77a^2b^6c^6 + 1735a^2b^7c^5 - 234a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 - 3714a^3b^2c^9 + 6252a^3b^3c^8 + 1730a^3b^4c^7 - 4300a^3b^5c^6 \\
& - 79a^3b^6c^5 + 968a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9c^2 - 3523a^4b^2c^8 + 5025a^4b^3c^7 + 1339a^4b^4c^6 - 2082a^4b^5c^5 - 192a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 2031a^5b^2c^7 \\
& + 2104a^5b^3c^6 + 634a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 676a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 100a^7b^2c^5 - 404ab^12c^8) / c^8 * (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- \\
& (4ac - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 - 3b^2c^4 * (- (4ac - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (- (4ac - b^2)^3)^{1/2} \\
& - 10ab^6c - 3a^2b^2c^2 * (- (4ac - b^2)^3)^{1/2} - 6ab^3c^3 * (- (4ac - b^2)^3)^{1/2} + 4ab^3c * (- (4ac - b^2)^3)^{1/2}) / (2 * (16a^2c^8 + b^4c^6 - 8ab^2c^7))^{1/2} - (2048 * \tan(x/2) * (20ab^12c^{12} \\
& + 42a^12c^{12} - 58b^12c^{12} + 4b^12c - 4b^13 + 22c^{13} - 40a^2b^11 + 40a^3b^10 - 20a^4b^9 + 4a^5b^8 - 214a^2c^{11} - 938a^3c^{10} - 1538a^4c^9 - 1278a^5c^8 - 498a^6c^7 - 14a^7c^6 + 52a^8c^5 \\
& + 12a^9c^4 + 14b^2c^{11} + 34b^3c^{10} + 59b^4c^9 - 39b^5c^8 - 160b^6c^7 + 112b^7c^6 + 105b^8c^5 - 89b^9c^4 - 28b^{10}c^3 + 28b^{11}c^2 - 518ab^2c^{11} - 264a^2b^3c^9 + 1339a^2b^4c^8 - 92a^2b^5c^7 \\
& - 1312a^2b^6c^6 + 268a^2b^7c^5 + 649a^2b^8c^4 - 124a^2b^9c^3 - 180a^2b^{10}c^2 + 1550a^2b^10c^{10} - 160a^2b^{10}c + 3488a^3b^9c^9 + 320a^3b^9c + 3350a^4b^8c^8 - 300a^4b^8c \\
& + 1092a^5b^7c^7 + 136a^5b^7c - 462a^6b^6c^6 - 24a^6b^6c^6 - 40a^7b^5c^5 - 92a^8b^4c^4 - 1568a^2b^2c^9 - 2708a^2b^3c^8 + 3564a^2b^4c^7 + 1964a^2b^5c^6 - 2790a^2b^6c^5 - 922a^2b^7c^4 + 1048a^
\end{aligned}$$

$$\begin{aligned}
& 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^
\end{aligned}$$

$$\begin{aligned}
& 12 + 2328a^3c^{11} + 2784a^4c^{10} + 1948a^5c^9 + 780a^6c^8 + 160a^7c^7 + 12a^8c^6 - 39b^2c^{12} + 121b^3c^{11} + 61b^4c^{10} - 220b^5c^9 - \\
& 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 635a*b^2c^{11} + 1300a*b^3c^{10} + 608a*b^4c^9 - 179 \\
& 2a*b^5c^8 - 60a*b^6c^7 + 1218a*b^7c^6 - 249a*b^8c^5 - 340a*b^9c^4 + 98a*b^{10}c^3 + 20a*b^{11}c^2 - 1616a^2*b*c^{11} - 3160a^3*b*c^{10} - 3440 \\
& a^4*b*c^9 - 2132a^5*b*c^8 - 704a^6*b*c^7 - 96a^7*b*c^6 - 2242a^2*b^2*c^{10} + 4146a^2*b^3*c^9 + 1420a^2*b^4*c^8 - 4158a^2*b^5*c^7 + 77a^2*b^6*c^6 + 1735a^2*b^7*c^5 - \\
& 234a^2*b^8*c^4 - 222a^2*b^9*c^3 + 4a^2*b^{10}c^2 - 3714a^3*b^2*c^9 + 6252a^3*b^3*c^8 + 1730a^3*b^4*c^7 - 4300a^3*b^5*c^6 - 79a^3*b^6*c^5 + 968a^3*b^7*c^4 + \\
& 2a^3*b^8*c^3 - 20a^3*b^9*c^2 - 3523a^4*b^2*c^8 + 5025a^4*b^3*c^7 + 1339a^4*b^4*c^6 - 2082a^4*b^5*c^5 - 192a^4*b^6*c^4 + 156a^4*b^7*c^3 + 8a^4*b^8*c^2 - 2031a^5*b^2*c^7 + 2104a^5 \\
& b^3*c^6 + 634a^5*b^4*c^5 - 388a^5*b^5*c^4 - 60a^5*b^6*c^3 - 676a^6*b^2*c^6 + 364a^6*b^3*c^5 + 136a^6*b^4*c^4 - 100a^7*b^2*c^5 - 404a*b*c^{12}) \\
& )/c^8)*(-8a*c^7 + b^8 + 24a^2*c^6 + 24a^3*c^5 + 8a^4*c^4 - b^5*(-(4a*c - b^2)^3)^{(1/2)} - 2b^2*c^6 + 3b^4*c^4 - 3b^6*c^2 - 18a*b^2*c^5 + 24a \\
& *b^4*c^3 - 3b*c^4*(-(4a*c - b^2)^3)^{(1/2)} - 54a^2*b^2*c^4 + 33a^2*b^4*c^2 - 38a^3*b^2*c^3 + 3b^3*c^2*(-(4a*c - b^2)^3)^{(1/2)} - 10a*b^6*c - 3a \\
& ^2*b*c^2*(-(4a*c - b^2)^3)^{(1/2)} - 6a*b*c^3*(-(4a*c - b^2)^3)^{(1/2)} + 4a*b^3*c*(-(4a*c - b^2)^3)^{(1/2)})/(2*(16a^2*c^8 + b^4*c^6 - 8a*b^2*c^7)) \\
& )^{(1/2)} + (2048*\tan(x/2)*(20a*b^{12} + 42a*c^{12} - 58b*c^{12} + 4b^{12}c - 4b^{13} + 22c^{13} - 40a^2*b^{11} + 40a^3*b^{10} - 20a^4*b^9 + 4a^5*b^8 - 214a^2 \\
& c^{11} - 938a^3*c^{10} - 1538a^4*c^9 - 1278a^5*c^8 - 498a^6*c^7 - 14a^7*c^6 + 52a^8*c^5 + 12a^9*c^4 + 14b^2*c^{11} + 34b^3*c^{10} + 59b^4*c^9 - 39 \\
& *b^5*c^8 - 160b^6*c^7 + 112b^7*c^6 + 105b^8*c^5 - 89b^9*c^4 - 28b^{10}c^3 + 28b^{11}c^2 - 518a*b^2*c^{10} - 264a*b^3*c^9 + 1339a*b^4*c^8 - 92a*b \\
& ^5*c^7 - 1312a*b^6*c^6 + 268a*b^7*c^5 + 649a*b^8*c^4 - 124a*b^9*c^3 - 180a*b^{10}c^2 + 1550a^2*b*c^{10} - 160a^2*b^{10}c + 3488a^3*b*c^9 + 320a^3 \\
& *b^9*c + 3350a^4*b*c^8 - 300a^4*b^8*c + 1092a^5*b*c^7 + 136a^5*b^7*c - 462a^6*b*c^6 - 24a^6*b^6*c - 440a^7*b*c^5 - 92a^8*b*c^4 - 1568a^2*b^2* \\
& c^9 - 2708a^2*b^3*c^8 + 3564a^2*b^4*c^7 + 1964a^2*b^5*c^6 - 2790a^2*b^6*c^5 - 922a^2*b^7*c^4 + 1048a^2*b^8*c^3 + 276a^2*b^9*c^2 - 652a^3*b^2*c^8 \\
& - 6280a^3*b^3*c^7 + 2020a^3*b^4*c^6 + 4988a^3*b^5*c^5 - 1118a^3*b^6*c^4 - 2008a^3*b^7*c^3 + 140a^3*b^8*c^2 + 2350a^4*b^2*c^7 - 5630a^4*b^3*c^6 - \\
& 2295a^4*b^4*c^5 + 3563a^4*b^5*c^4 + 1260a^4*b^6*c^3 - 740a^4*b^7*c^2 + 3314a^5*b^2*c^6 - 1456a^5*b^3*c^5 - 2771a^5*b^4*c^4 + 308a^5*b^5*c^3 + 732a^5*b^6*c^2 + \\
& 1572a^6*b^2*c^5 + 576a^6*b^3*c^4 - 696a^6*b^4*c^3 - 300a^6*b^5*c^2 + 192a^7*b^2*c^4 + 272a^7*b^3*c^3 + 44a^7*b^4*c^2 - 32a^8*b^2*c^3 + 148a*b*c^{11} + 24a*b^{11}c))/c^8)*(-8a*c^7 + b^8 + 24a^2 \\
& c^6 + 24a^3*c^5 + 8a^4*c^4 - b^5*(-(4a*c - b^2)^3)^{(1/2)} - 2b^2*c^6 + 3b^4*c^4 - 3b^6*c^2 - 18a*b^2*c^5 + 24a*b^4*c^3 - 3b*c^4*(-(4a*c - b^2)^3)^{(1/2)} - \\
& 54a^2*b^2*c^4 + 33a^2*b^4*c^2 - 38a^3*b^2*c^3 + 3b^3*c^2*(-(4a*c - b^2)^3)^{(1/2)} - 10a*b^6*c - 3a^2*b*c^2*(-(4a*c - b^2)^3)^{(1/2)} - 6a*b*c^3*(-(4a*c - b^2)^3)^{(1/2)} + 4a*b^3*c*(-(4a*c - b^2)^3)^{(1/2)}) \\
& )/(2*(16a^2*c^8 + b^4*c^6 - 8a*b^2*c^7))^{(1/2)}*1i)/((4096*(16a*b^{11} + 274a*c^{11} - 78b*c^{11} + 4b^{11}c - 4b^{12} + 33c^{12} - 16a^2*b^{10} - 16a^3*b^9 \\
& + 40a^4*b^8 - 16a^5*b^7 - 16a^6*b^6 + 16a^7*b^5 - 4a^8*b^4 + 1008a^2*c^{10} + 2156a^3*c^9 + 2954a^4*c^8 + 2688a^5*c^7 + 1624a^6*c^6 + 628 \\
& a^7*c^5 + 141a^8*c^4 + 14a^9*c^3 - 64b^2*c^{10} + 268b^3*c^9 - 26b^4*c^8 - 348b^5*c^7 + 144b^6*c^6 + 208b^7*c^5 - 123b^8*c^4 - 54b^9*c^3 + 40 \\
& *b^{10}c^2 - 520a*b^2*c^9 + 1516a*b^3*c^8 + 144a*b^4*c^7 - 1564a*b^5*c^6 + 228a*b^6*c^5 + 740a*b^7*c^4 - 146a*b^8*c^3 - 164a*b^9*c^2 - 1624a^2 \\
& *b*c^9 - 112a^2*b^9*c - 2676a^3*b*c^8 + 128a^3*b^8*c - 2588a^4*b*c^7 + 56a^4*b^7*c - 1388a^5*b*c^6 - 184a^5*b^6*c - 264a^6*b*c^5 + 80a^6*b^5*c \\
& + 116a^7*b*c^4 + 32a^7*b^4*c + 74a^8*b*c^3 - 28a^8*b^3*c + 12a^9*b*c^2 + 4a^9*b^2*c - 1820a^2*b^2*c^8 + 3576a^2*b^3*c^7 + 1032a^2*b^4*c^6 - 2792a^2*b^5*c^5 - \\
& 236a^2*b^6*c^4 + 920a^2*b^7*c^3 + 64a^2*b^8*c^2 - 3584a^3*b^2*c^7 + 4472a^3*b^3*c^6 + 2236a^3*b^4*c^5 - 2436a^3*b^5*c^4 - 7
\end{aligned}$$



$$\begin{aligned}
& 44a^3b^6c^3 + 464a^3b^7c^2 - 4336a^4b^2c^6 + 3040a^4b^3c^5 + 2390a^4b^4c^4 - 964a^4b^5c^3 - 592a^4b^6c^2 - 3284a^5b^2c^5 + 908a^5b^3c^4 + 1364a^5b^4c^3 - 40a^5b^5c^2 - 1500a^6b^2c^4 - 104a^6b^3c^3 + 384a^6b^4c^2 - 360a^7b^2c^3 - 144a^7b^3c^2 - 24a^8b^2c^2 - 544a^8b^3c^2 - 544a^8b^4c^2 + 20a^8b^5c^2) / c^8 + (((((2048(48a^8c^15 + 272a^2c^14 + 576a^3c^13 + 576a^4c^12 + 272a^5c^11 + 48a^6c^10 - 12b^2c^14 + 20b^3c^13 + 18b^4c^12 - 46b^5c^11 + 6b^6c^10 + 26b^7c^9 - 12b^8c^8 - 140a^2b^2c^13 + 288a^2b^3c^12 + 30a^2b^4c^11 - 240a^2b^5c^10 + 74a^2b^6c^9 + 20a^2b^7c^8 - 416a^2b^8c^7 - 736a^3b^2c^12 - 544a^3b^3c^11 - 144a^3b^4c^10 - 360a^3b^5c^9 + 728a^3b^6c^8 - 50a^3b^7c^7 - 182a^3b^8c^6 + 4a^4b^2c^13 - 360a^4b^3c^12 + 544a^4b^4c^11 - 182a^4b^5c^10 + 10a^4b^6c^9 - 20a^4b^7c^8 - 172a^4b^8c^7 + 116a^5b^2c^12 + 8a^5b^3c^11 - 44a^5b^4c^10 - 80a^5b^5c^9 - 80a^5b^6c^8 - 80a^5b^7c^7 - 80a^5b^8c^6)) / c^8 - (2048 \tan(x/2) * (-8a^8c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (-4ac - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 - 3b^2c^4 * (-4ac - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (-4ac - b^2)^3)^{(1/2)} - 10a^2b^6c - 3a^2b^8c^2 * (-4ac - b^2)^3)^{(1/2)} - 6a^2b^8c^3 * (-4ac - b^2)^3)^{(1/2)} + 4a^2b^3c * (-4ac - b^2)^3)^{(1/2)}) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7))^{(1/2)} * (32a^2c^16 - 64a^2c^15 - 128a^3c^14 + 64a^4c^13 + 96a^5c^12 - 8b^2c^15 + 24b^3c^14 - 32b^4c^13 + 32b^5c^12 - 24b^6c^11 + 8b^7c^10 + 144a^2b^2c^14 - 200a^2b^3c^13 + 184a^2b^4c^12 - 56a^2b^5c^11 - 8a^2b^6c^10 + 288a^2b^7c^9 + 352a^2b^8c^8 - 32a^3b^2c^14 - 320a^3b^3c^13 + 8a^3b^4c^12 + 96a^3b^5c^11 - 8a^3b^6c^10 - 272a^3b^7c^9 + 40a^3b^8c^8 + 8a^4b^2c^14 - 56a^4b^3c^13 - 96a^4b^4c^12 - 96a^4b^5c^11 - 96a^4b^6c^10 - 96a^4b^7c^9 - 96a^4b^8c^8) / c^8) * (-8a^8c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (-4ac - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 - 3b^2c^4 * (-4ac - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (-4ac - b^2)^3)^{(1/2)} - 10a^2b^6c - 3a^2b^8c^2 * (-4ac - b^2)^3)^{(1/2)} - 6a^2b^8c^3 * (-4ac - b^2)^3)^{(1/2)} + 4a^2b^3c * (-4ac - b^2)^3)^{(1/2)}) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7))^{(1/2)} + (2048 \tan(x/2) * (24b^2c^14 - 96a^2c^14 - 8c^15 + 152a^2c^13 + 952a^3c^12 + 1096a^4c^11 + 304a^5c^10 - 152a^6c^9 - 72a^7c^8 + 2b^2c^13 - 38b^3c^12 - 7b^4c^11 + 39b^5c^10 - 15b^6c^9 + 35b^7c^8 - 44b^8c^7 - 4b^9c^6 + 24b^10c^5 - 8b^11c^4 + 68a^2b^2c^12 + 42a^2b^3c^11 - 159a^2b^4c^10 - 400a^2b^5c^9 + 537a^2b^6c^8 + 68a^2b^7c^7 - 276a^2b^8c^6 + 72a^2b^9c^5 + 8a^2b^10c^4 - 944a^2b^2c^12 - 2520a^3b^2c^11 - 1824a^4b^2c^10 - 272a^5b^2c^9 + 88a^6b^2c^8 + 584a^7b^2c^7 + 1742a^8b^2c^6 - 1645a^9b^2c^5 - 795a^10b^2c^4 + 1132a^11b^2c^3 - 112a^12b^2c^2 - 12a^13b^2c^1 + 8a^14b^2c^0 + 476a^3b^2c^10 + 2766a^3b^3c^9 - 1705a^3b^4c^8 - 396a^3b^5c^7 + 456a^3b^6c^6 - 56a^3b^7c^5 - 8a^3b^8c^4 + 230a^4b^2c^9 + 880a^4b^3c^8 - 656a^4b^4c^7 + 140a^4b^5c^6 + 72a^4b^6c^5 + 464a^4b^7c^4 - 192a^4b^8c^3 - 220a^4b^9c^2 + 256a^4b^10c^1 + 136a^4b^11c^0) / c^8) * (-8a^8c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (-4ac - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 - 3b^2c^4 * (-4ac - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (-4ac - b^2)^3)^{(1/2)} - 10a^2b^6c - 3a^2b^8c^2 * (-4ac - b^2)^3)^{(1/2)} - 6a^2b^8c^3 * (-4ac - b^2)^3)^{(1/2)} + 4a^2b^3c * (-4ac - b^2)^3)^{(1/2)}) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7))^{(1/2)} + (2048 * (236a^2c^13 - 32b^2c^13 + 12c^14 + 1084a^2c^12 + 2328a^3c^11 + 2784a^4c^10 + 1948a^5c^9 + 780a^6c^8 + 160a^7c^7 + 12a^8c^6 - 39b^2c^12 + 121b^3c^11 + 61b^4c^10 - 220b^5c^9 - 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^10c^4 + 26b^11c^3 - 12b^12c^2 - 635a^2b^2c^11 + 1300a^2b^3c^10 + 608a^2b^4c^9 - 1792a^2b^5c^8 - 60a^2b^6c^7 + 1218a^2b^7c^6 - 249a^2b^8c^5 - 340a^2b^9c^4 + 98a^2b^10c^3 + 20a^2b^11c^2 - 1616a^2b^2c^11 - 3160a^3b^2c^10 - 3440a^4b^2c^9 - 2132a^5b^2c^8 - 704a^6b^2c^7 - 96a^7b^2c^6 - 2242a^8b^2c^5 + 4146a^9b^2c^4 + 1420a^10b^2c^3 - 4158a^11b^2c^2 + 5c^7 + 77a^2b^6c^6 + 1735a^2b^7c^5 - 234a^2b^8c^4 - 222a^2b^9c^3)
\end{aligned}$$

$$\begin{aligned}
& \wedge^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
\end{aligned}$$

$$\begin{aligned}
& *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 + 3 \\
& 564*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 + 1 \\
& 048*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 + 20 \\
& 20*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 + 1 \\
& 40*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 + 3
\end{aligned}$$

$$\begin{aligned}
& 563a^4b^5c^4 + 1260a^4b^6c^3 - 740a^4b^7c^2 + 3314a^5b^2c^6 - 1456a^5b^3c^5 - 2771a^5b^4c^4 + 308a^5b^5c^3 + 732a^5b^6c^2 + 1572a^6b^2c^5 + 576a^6b^3c^4 - 696a^6b^4c^3 - 300a^6b^5c^2 + 192a^7b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 148a^8b^3c^2 \\
& - 11 + 24a^8b^4c^1) / c^8 * (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- (4a^2c^3 - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 - 3b^2c^4 * (- (4a^2c^3 - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} - 10a^2b^6c - 3a^2b^2c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} - 6a^2b^2c^3 * (- (4a^2c^3 - b^2)^3)^{1/2} + 4a^2b^3c * (- (4a^2c^3 - b^2)^3)^{1/2}) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7))^{1/2} * (- (8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- (4a^2c^3 - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 - 3b^2c^4 * (- (4a^2c^3 - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} - 10a^2b^6c - 3a^2b^2c^2 * (- (4a^2c^3 - b^2)^3)^{1/2} - 6a^2b^2c^3 * (- (4a^2c^3 - b^2)^3)^{1/2} + 4a^2b^3c * (- (4a^2c^3 - b^2)^3)^{1/2}) / (2 * (16a^2c^8 + b^4c^6 - 8a^2b^2c^7))^{1/2} * 2i + (\operatorname{atan}(\frac{(((((2048 * (236a^13 - 32b^13 + 12c^14 + 1084a^2c^12 + 2328a^3c^11 + 2784a^4c^10 + 1948a^5c^9 + 780a^6c^8 + 160a^7c^7 + 12a^8c^6 - 39b^2c^12 + 121b^3c^11 + 61b^4c^10 - 220b^5c^9 - 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^10c^4 + 26b^11c^3 - 12b^12c^2 - 635a^2b^2c^11 + 1300a^2b^3c^10 + 608a^2b^4c^9 - 1792a^2b^5c^8 - 60a^2b^6c^7 + 1218a^2b^7c^6 - 249a^2b^8c^5 - 340a^2b^9c^4 + 98a^2b^10c^3 + 20a^2b^11c^2 - 1616a^2b^2c^11 - 3160a^3b^2c^10 - 3440a^4b^2c^9 - 2132a^5b^2c^8 - 704a^6b^2c^7 - 96a^7b^2c^6 - 2242a^2b^2c^10 + 4146a^2b^3c^9 + 1420a^2b^4c^8 - 4158a^2b^5c^7 + 77a^2b^6c^6 + 1735a^2b^7c^5 - 234a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^10c^2 - 3714a^3b^2c^9 + 6252a^3b^3c^8 + 1730a^3b^4c^7 - 4300a^3b^5c^6 - 79a^3b^6c^5 + 968a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9c^2 - 3523a^4b^2c^8 + 5025a^4b^3c^7 + 1339a^4b^4c^6 - 2082a^4b^5c^5 - 192a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 2031a^5b^2c^7 + 2104a^5b^3c^6 + 634a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 676a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 100a^7b^2c^5 - 404a^8b^2c^12)) / c^8 + (((2048 * \tan(x/2) * (24b^14 - 96a^14 - 8c^15 + 152a^2c^13 + 952a^3c^12 + 1096a^4c^11 + 304a^5c^10 - 152a^6c^9 - 72a^7c^8 + 2b^2c^13 - 38b^3c^12 - 7b^4c^11 + 39b^5c^10 - 15b^6c^9 + 35b^7c^8 - 44b^8c^7 - 4b^9c^6 + 24b^10c^5 - 8b^11c^4 + 68a^2b^2c^12 + 42a^2b^3c^11 - 159a^2b^4c^10 - 400a^2b^5c^9 + 537a^2b^6c^8 + 68a^2b^7c^7 - 276a^2b^8c^6 + 72a^2b^9c^5 + 8a^2b^10c^4 - 944a^2b^2c^12 - 2520a^3b^2c^11 - 1824a^4b^2c^10 - 272a^5b^2c^9 + 88a^6b^2c^8 + 584a^2b^2c^11 + 1742a^2b^3c^10 - 1645a^2b^4c^9 - 795a^2b^5c^8 + 1132a^2b^6c^7 - 112a^2b^7c^6 - 112a^2b^8c^5 + 8a^2b^9c^4 + 476a^3b^2c^10 + 2766a^3b^3c^9 - 1705a^3b^4c^8 - 396a^3b^5c^7 + 456a^3b^6c^6 - 56a^3b^7c^5 - 8a^3b^8c^4 + 230a^4b^2c^9 + 880a^4b^3c^8 - 656a^4b^4c^7 + 140a^4b^5c^6 + 72a^4b^6c^5 + 464a^5b^2c^8 - 192a^5b^3c^7 - 220a^5b^4c^6 + 256a^6b^2c^7 + 136a^6b^2c^13)) / c^8 + (((2048 * (48a^15 + 272a^2c^14 + 576a^3c^13 + 576a^4c^12 + 272a^5c^11 + 48a^6c^10 - 12b^2c^14 + 20b^3c^13 + 18b^4c^12 - 46b^5c^11 + 6b^6c^10 + 26b^7c^9 - 12b^8c^8 - 140a^2b^2c^13 + 288a^2b^3c^12 + 30a^2b^4c^11 - 240a^2b^5c^10 + 74a^2b^6c^9 + 20a^2b^7c^8 - 416a^2b^2c^13 - 736a^3b^2c^12 - 544a^4b^2c^11 - 144a^5b^2c^10 - 360a^2b^2c^12 + 728a^2b^3c^11 - 50a^2b^4c^10 - 182a^2b^5c^9 + 4a^2b^6c^8 - 360a^3b^2c^11 + 544a^3b^3c^10 + 10a^3b^4c^9 - 20a^3b^5c^8 - 172a^4b^2c^10 + 116a^4b^3c^9 + 8a^4b^4c^8 - 44a^5b^2c^9 - 80a^2b^2c^14)) / c^8 - (2048 * \tan(x/2) * (a^2c^11 - b^2c^11 + (c^2 * 3i) / 2) * (32a^16 - 64a^2c^15 - 128a^3c^14 + 64a^4c^13 + 96a^5c^12 - 8b^2c^15 + 24b^3c^14 - 32b^4c^13 + 32b^5c^12 - 24b^6c^11 + 8b^7c^10 + 144a^2b^2c^14 - 200a^2b^3c^13 + 184a^2b^4c^12 - 56a^2b^5c^11 - 8a^2b^6c^10 + 288a^2b^2c^14 + 352a^3b^2c^13 - 32a^4b^2c^12 - 320a^2b^2c^13 + 8a^2b^3c^12 + 96a^2b^4c^11 - 8a^2b^5c^10 - 272a^3b^2c^12 + 40a^3b^3c^11 +
\end{aligned}$$

$$\begin{aligned}
& (8a^3b^4c^{10} - 56a^4b^2c^{11} - 96a^5b^2c^{15})/c^{11} * (a^2c^3i - b^2c^3i + (c^2*3i)/2)/c^3 * (a^2c^3i - b^2c^3i + (c^2*3i)/2)/c^3 * (a^2c^3i - b^2c^3i + (c^2*3i)/2)/c^3 - (2048*\tan(x/2)*(20a^2b^{12} + 42a^3c^{12} - 58b^2c^{12} + 4b^{12}c^2 - 4b^{13} + 22c^{13} - 40a^2b^{11} + 40a^3b^{10} - 20a^4b^9 + 4a^5b^8 - 214a^2c^{11} - 938a^3c^{10} - 1538a^4c^9 - 1278a^5c^8 - 498a^6c^7 - 14a^7c^6 + 52a^8c^5 + 12a^9c^4 + 14b^2c^{11} + 34b^3c^{10} + 59b^4c^9 - 39b^5c^8 - 160b^6c^7 + 112b^7c^6 + 105b^8c^5 - 89b^9c^4 - 28b^{10}c^3 + 28b^{11}c^2 - 518a^2b^2c^{10} - 264a^2b^3c^9 + 1339a^2b^4c^8 - 92a^2b^5c^7 - 1312a^2b^6c^6 + 268a^2b^7c^5 + 649a^2b^8c^4 - 124a^2b^9c^3 - 180a^2b^{10}c^2 + 1550a^2b^{11}c + 3488a^3b^2c^9 + 320a^3b^3c^8 + 3350a^3b^4c^7 - 300a^4b^2c^8 + 1092a^4b^3c^7 + 136a^5b^2c^7 - 462a^5b^3c^6 - 24a^6b^2c^6 - 440a^6b^3c^5 - 92a^7b^2c^5 - 1568a^7b^3c^4 - 2708a^7b^4c^3 + 3564a^7b^5c^2 + 1964a^7b^6c^1 - 2790a^7b^7c^0 - 922a^8b^2c^9 + 1048a^8b^3c^8 + 276a^8b^4c^7 - 652a^8b^5c^6 - 6280a^8b^6c^5 + 2020a^8b^7c^4 + 4988a^8b^8c^3 + 2350a^8b^9c^2 - 5630a^8b^{10}c^1 - 2295a^8b^{11}c^0 + 3563a^9b^2c^9 + 1260a^9b^3c^8 - 740a^9b^4c^7 + 3314a^9b^5c^6 - 1456a^9b^6c^5 - 2771a^9b^7c^4 + 308a^9b^8c^3 + 732a^9b^9c^2 + 1572a^9b^{10}c^1 + 576a^9b^{11}c^0 - 696a^{10}b^2c^9 - 300a^{10}b^3c^8 + 192a^{10}b^4c^7 + 272a^{10}b^5c^6 + 44a^{10}b^6c^5 - 32a^{10}b^7c^4 + 148a^{10}b^8c^3 + 24a^{10}b^9c^2 + 24a^{10}b^{10}c^1 + 24a^{10}b^{11}c^0)/c^8 * (a^2c^3i - b^2c^3i + (c^2*3i)/2)*1i/c^3 - (((((2048*(236a^3c^{13} - 32b^2c^{13} + 12c^{14} + 1084a^2c^{12} + 2328a^3c^{11} + 2784a^4c^{10} + 1948a^5c^9 + 780a^6c^8 + 160a^7c^7 + 12a^8c^6 - 39b^2c^{12} + 121b^3c^{11} + 61b^4c^{10} - 220b^5c^9 - 36b^6c^8 + 232b^7c^7 - 28b^8c^6 - 127b^9c^5 + 42b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 635a^2b^2c^{11} + 1300a^2b^3c^{10} + 608a^2b^4c^9 - 1792a^2b^5c^8 - 60a^2b^6c^7 + 1218a^2b^7c^6 - 249a^2b^8c^5 - 340a^2b^9c^4 + 98a^2b^{10}c^3 + 20a^2b^{11}c^2 - 1616a^2b^{12}c^1 - 3160a^3b^2c^{10} - 3440a^3b^3c^9 - 2132a^3b^4c^8 - 704a^3b^5c^7 - 96a^3b^6c^6 - 2242a^3b^7c^5 + 4146a^3b^8c^4 - 4158a^3b^9c^3 + 77a^3b^{10}c^2 - 3714a^3b^{11}c^1 + 6252a^3b^{12}c^0 + 1730a^4b^2c^9 - 4300a^4b^3c^8 - 79a^4b^4c^7 + 968a^4b^5c^6 + 2a^4b^6c^5 - 20a^4b^7c^4 - 3523a^4b^8c^3 + 5025a^4b^9c^2 + 1339a^4b^{10}c^1 - 2082a^4b^{11}c^0 - 192a^4b^{12}c^0 + 156a^5b^2c^9 + 8a^5b^3c^8 - 2031a^5b^4c^7 + 2104a^5b^5c^6 + 634a^5b^6c^5 - 388a^5b^7c^4 - 60a^5b^8c^3 - 676a^5b^9c^2 + 364a^5b^{10}c^1 + 136a^5b^{11}c^0 - 100a^6b^2c^9 - 404a^6b^3c^8 + 364a^6b^4c^7 - 100a^6b^5c^6 - 404a^6b^6c^5 + 136a^6b^7c^4 - 100a^6b^8c^3 + 364a^6b^9c^2 + 136a^6b^{10}c^1 + 136a^6b^{11}c^0)/c^8 - (((2048*\tan(x/2)*(24b^2c^{14} - 96a^2c^{14} - 8c^{15} + 152a^2c^{13} + 952a^3c^{12} + 1096a^4c^{11} + 304a^5c^{10} - 152a^6c^9 - 72a^7c^8 + 2b^2c^{13} - 38b^3c^{12} - 7b^4c^{11} + 39b^5c^{10} - 15b^6c^9 + 35b^7c^8 - 44b^8c^7 - 4b^9c^6 + 24b^{10}c^5 - 8b^{11}c^4 + 68a^2b^2c^{12} + 42a^2b^3c^{11} - 159a^2b^4c^{10} - 400a^2b^5c^9 + 537a^2b^6c^8 + 68a^2b^7c^7 - 276a^2b^8c^6 + 72a^2b^9c^5 + 8a^2b^{10}c^4 - 944a^2b^{11}c^3 - 2520a^2b^{12}c^2 - 1824a^3b^2c^{10} - 272a^3b^3c^9 + 88a^3b^4c^8 + 584a^3b^5c^7 - 1742a^3b^6c^6 - 112a^3b^7c^5 - 112a^3b^8c^4 + 476a^3b^9c^3 + 476a^3b^{10}c^2 + 2766a^3b^{11}c^1 - 1705a^3b^{12}c^0 - 396a^4b^2c^9 + 456a^4b^3c^8 - 56a^4b^4c^7 - 8a^4b^5c^6 + 230a^4b^6c^5 + 880a^4b^7c^4 - 656a^4b^8c^3 + 140a^4b^9c^2 + 72a^4b^{10}c^1 + 464a^4b^{11}c^0 - 192a^5b^2c^9 - 220a^5b^3c^8 + 256a^5b^4c^7 + 136a^5b^5c^6 + 136a^5b^6c^5 + 136a^5b^7c^4 + 136a^5b^8c^3 + 136a^5b^9c^2 + 136a^5b^{10}c^1 + 136a^5b^{11}c^0)/c^8 - (((2048*(48a^3c^{15} + 272a^2c^{14} + 576a^3c^{13} + 576a^4c^{12} + 272a^5c^{11} + 48a^6c^{10} - 12b^2c^{14} + 20b^3c^{13} + 18b^4c^{12} - 46b^5c^{11} + 6b^6c^{10} + 26b^7c^9 - 12b^8c^8 - 140a^2b^2c^{13} + 288a^2b^3c^{12} + 30a^2b^4c^{11} - 240a^2b^5c^{10} + 74a^2b^6c^9 + 20a^2b^7c^8 - 416a^2b^8c^7 - 736a^2b^9c^6 - 544a^2b^{10}c^5 - 144a^2b^{11}c^4 - 360a^2b^{12}c^3 + 728a^2b^3c^{11} - 50a^2b^4c^{10} - 182a^2b^5c^9 + 4a^2b^6c^8 - 360a^3b^2c^{11} + 544a^3b^3c^{10} + 10a^3b^4c^9 - 20a^3b^5c^8 - 172a^3b^6c^7 - 172a^3b^7c^6 - 172a^3b^8c^5 - 172a^3b^9c^4 - 172a^3b^{10}c^3 - 172a^3b^{11}c^2 - 172a^3b^{12}c^1 + 116a^4b^2c^9 + 8a^4b^3c^8 - 44a^4b^4c^7 - 80a^4b^5c^6 - 80a^4b^6c^5 - 80a^4b^7c^4 - 80a^4b^8c^3 - 80a^4b^9c^2 - 80a^4b^{10}c^1 - 80a^4b^{11}c^0)/c^8 + (2048*\tan(x/2)*(a^2c^3i - b^2c^3i + (c^2*3i)/2)*(32a^2c^{16} - 64a^2c^{15} - 12
\end{aligned}$$

$$\begin{aligned}
&8a^3c^{14} + 64a^4c^{13} + 96a^5c^{12} - 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144a^2b^2c^{14} - 200a^2b^3c^{13} + 184a^2b^4c^{12} - 56a^2b^5c^{11} - 8a^2b^6c^{10} + 288a^2b^2c^{14} + 352a^3b^2c^{13} - 32a^4b^2c^{12} - 320a^2b^2c^{13} + 8a^2b^3c^{12} + 96a^2b^4c^{11} - 8a^2b^5c^{10} - 272a^3b^2c^{12} + 40a^3b^3c^{11} + 8a^3b^4c^{10} - 56a^4b^2c^{11} - 96a^4b^3c^{10} \\
&)/c^{11}*(a^2c^{11} - b^2c^{11} + (c^2*3i)/2))/c^3*(a^2c^{11} - b^2c^{11} + (c^2*3i)/2))/c^3*(a^2c^{11} - b^2c^{11} + (c^2*3i)/2))/c^3 + (2048*\tan(x/2)*(20a^2b^{12} + 42a^2c^{12} - 58b^2c^{12} + 4b^{12}c - 4b^{13} + 22c^{13} - 40a^2b^{11} + 40a^3b^{10} - 20a^4b^9 + 4a^5b^8 - 214a^2c^{11} - 938a^3c^{10} - 1538a^4c^9 - 1278a^5c^8 - 498a^6c^7 - 14a^7c^6 + 52a^8c^5 + 12a^9c^4 + 14b^2c^{11} + 34b^3c^{10} + 59b^4c^9 - 39b^5c^8 - 160b^6c^7 + 112b^7c^6 + 105b^8c^5 - 89b^9c^4 - 28b^{10}c^3 + 28b^{11}c^2 - 518a^2b^2c^{10} - 264a^2b^3c^9 + 1339a^2b^4c^8 - 92a^2b^5c^7 - 1312a^2b^6c^6 + 268a^2b^7c^5 + 649a^2b^8c^4 - 124a^2b^9c^3 - 180a^2b^{10}c^2 + 1550a^2b^{11}c - 160a^2b^{12} + 3488a^3b^2c^9 + 320a^3b^3c^8 + 3350a^4b^2c^7 - 300a^4b^3c^6 + 1092a^5b^2c^5 + 136a^5b^3c^4 - 462a^6b^2c^3 - 24a^6b^3c^2 - 440a^7b^2c - 92a^8b^2c^9 - 1568a^2b^2c^9 - 2708a^2b^3c^8 + 3564a^2b^4c^7 + 1964a^2b^5c^6 - 2790a^2b^6c^5 - 922a^2b^7c^4 + 1048a^2b^8c^3 + 276a^2b^9c^2 - 652a^3b^2c^8 - 6280a^3b^3c^7 + 2020a^3b^4c^6 + 4988a^3b^5c^5 - 1118a^3b^6c^4 - 2008a^3b^7c^3 + 140a^3b^8c^2 + 2350a^4b^2c^7 - 5630a^4b^3c^6 - 2295a^4b^4c^5 + 3563a^4b^5c^4 + 1260a^4b^6c^3 - 740a^4b^7c^2 + 3314a^5b^2c^6 - 1456a^5b^3c^5 - 2771a^5b^4c^4 + 308a^5b^5c^3 + 732a^5b^6c^2 + 1572a^6b^2c^5 + 576a^6b^3c^4 - 696a^6b^4c^3 - 300a^6b^5c^2 + 192a^7b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 148a^8b^3c^2 + 24a^8b^4c - 148a^8b^5c^9 + 24a^8b^6c^8 + 24a^8b^7c^7 + 24a^8b^8c^6 + 24a^8b^9c^5 + 24a^8b^{10}c^4 + 24a^8b^{11}c^3 + 24a^8b^{12}c^2 + 24a^8b^{13}c - 148a^8b^{14} + 24a^8b^{15}))/c^8*(a^2c^{11} - b^2c^{11} + (c^2*3i)/2)*1i)/c^3)/((4096*(16a^2b^{11} + 274a^2c^{11} - 78b^2c^{11} + 4b^{11}c - 4b^{12} + 33c^{12} - 16a^2b^{10} - 16a^3b^9 + 40a^4b^8 - 16a^5b^7 - 16a^6b^6 + 16a^7b^5 - 4a^8b^4 + 1008a^2c^{10} + 2156a^3c^9 + 2954a^4c^8 + 2688a^5c^7 + 1624a^6c^6 + 628a^7c^5 + 141a^8c^4 + 14a^9c^3 - 64b^2c^{10} + 268b^3c^9 - 26b^4c^8 - 348b^5c^7 + 144b^6c^6 + 208b^7c^5 - 123b^8c^4 - 54b^9c^3 + 40b^{10}c^2 - 520a^2b^2c^9 + 1516a^2b^3c^8 + 144a^2b^4c^7 - 1564a^2b^5c^6 + 228a^2b^6c^5 + 740a^2b^7c^4 - 146a^2b^8c^3 - 164a^2b^9c^2 - 1624a^2b^{10}c - 112a^2b^{11}c^9 - 2676a^3b^2c^8 + 128a^3b^3c^7 - 2588a^4b^2c^6 + 56a^4b^3c^5 - 1388a^5b^2c^4 - 184a^5b^3c^3 - 264a^6b^2c^2 + 80a^6b^3c - 116a^7b^2c^9 + 32a^7b^3c^8 + 74a^8b^2c^7 - 28a^8b^3c^6 + 12a^9b^2c^5 + 4a^9b^3c^4 - 1820a^2b^2c^8 + 3576a^2b^3c^7 + 1032a^2b^4c^6 - 2792a^2b^5c^5 - 236a^2b^6c^4 + 920a^2b^7c^3 + 64a^2b^8c^2 - 3584a^3b^2c^7 + 4472a^3b^3c^6 + 2236a^3b^4c^5 - 2436a^3b^5c^4 - 744a^3b^6c^3 + 464a^3b^7c^2 - 4336a^4b^2c^6 + 3040a^4b^3c^5 + 2390a^4b^4c^4 - 964a^4b^5c^3 - 592a^4b^6c^2 - 3284a^5b^2c^5 + 908a^5b^3c^4 + 1364a^5b^4c^3 - 40a^5b^5c^2 - 1500a^6b^2c^4 - 104a^6b^3c^3 + 384a^6b^4c^2 - 360a^7b^2c^3 - 144a^7b^3c^2 - 24a^8b^2c^2 - 544a^8b^3c - 20a^8b^4c^9 + 20a^8b^5c^8 + 20a^8b^6c^7 + 1218a^8b^7c^6 - 249a^8b^8c^5 - 340a^8b^9c^4 + 98a^8b^{10}c^3 + 20a^8b^{11}c^2 - 1616a^2b^2c^{11} - 3160a^3b^2c^{10} - 3440a^4b^2c^9 - 2132a^5b^2c^8 - 704a^6b^2c^7 - 96a^7b^2c^6 - 2242a^2b^2c^{10} + 4146a^2b^3c^9 + 1420a^2b^4c^8 - 4158a^2b^5c^7 + 77a^2b^6c^6 + 1735a^2b^7c^5 - 234a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 - 3714a^3b^2c^9 + 6252a^3b^3c^8 + 1730a^3b^4c^7 - 4300a^3b^5c^6 - 79a^3b^6c^5 + 968a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9c^2 - 3523a^4b^2c^8 + 5025a^4b^3c^7 + 1339a^4b^4c^6 - 2082a^4b^5c^5 - 192a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 2031a^5b^2c^7 + 2104a^5b^3c^6 + 634a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 676a^6b^2c^6 + 364a^6b^3c^5 - 364a^6b^4c^4 + 364a^6b^5c^3 - 364a^6b^6c^2 + 364a^6b^7c - 364a^6b^8 + 364a^6b^9 - 364a^6b^{10} + 364a^6b^{11} - 364a^6b^{12} + 364a^6b^{13} - 364a^6b^{14} + 364a^6b^{15}))/c^8
\end{aligned}$$

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

$$\begin{aligned}
& *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 + 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 \\
& )/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^{11} \\
& 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^{12} \\
& 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^{10} \\
& 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
\end{aligned}$$

**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
```

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

**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]  $-x/c + 2 \arctan\left(\frac{(b-2c - (-4ac+b^2)^{1/2})^{1/2} \tan(x/2)}{(b+2c - (-4ac+b^2)^{1/2})^{1/2}}\right) \frac{(b+(-b^2+2c(a+c))/(-4ac+b^2)^{1/2})/c}{(b-2c - (-4ac+b^2)^{1/2})^{1/2} / (b+2c - (-4ac+b^2)^{1/2})^{1/2}} + 2 \arctan\left(\frac{(b-2c + (-4ac+b^2)^{1/2})^{1/2} \tan(x/2)}{(b+2c + (-4ac+b^2)^{1/2})^{1/2}}\right) \frac{(b+(b^2-2c(a+c))/(-4ac+b^2)^{1/2})/c}{(b-2c + (-4ac+b^2)^{1/2})^{1/2} / (b+2c + (-4ac+b^2)^{1/2})^{1/2}}$

**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]  $-(x/c) + \frac{2(b - (b^2 - 2c(a+c))/\sqrt{b^2 - 4ac}) \operatorname{ArcTan}\left[\frac{\sqrt{b - 2c - \sqrt{b^2 - 4ac}} \tan(x/2)}{\sqrt{b + 2c - \sqrt{b^2 - 4ac}}}\right]}{c \sqrt{b - 2c - \sqrt{b^2 - 4ac}} \sqrt{b + 2c - \sqrt{b^2 - 4ac}}} + \frac{2(b + (b^2 - 2c(a+c))/\sqrt{b^2 - 4ac}) \operatorname{ArcTan}\left[\frac{\sqrt{b - 2c + \sqrt{b^2 - 4ac}} \tan(x/2)}{\sqrt{b + 2c + \sqrt{b^2 - 4ac}}}\right]}{c \sqrt{b - 2c + \sqrt{b^2 - 4ac}} \sqrt{b + 2c + \sqrt{b^2 - 4ac}}}$

**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[ExpandTrig[(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] && IntegerQ[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

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

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

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

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 + Sqr
t[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

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

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)*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))*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) + 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 - 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
```

$$\begin{aligned}
& 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 - 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 - 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 + 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))*\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))*\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*\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 + \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*\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
\end{aligned}$$

$$\begin{aligned}
&^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 + \sqrt{ \\
&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*\text{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))
\end{aligned}$$

**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] 
$$\frac{1}{c} \frac{a \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2} \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} + \frac{1}{c} \frac{a \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2} \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} + \frac{b+2a}{(-4ac+b^2)^{1/2}} \frac{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \frac{b+2a}{(-4ac+b^2)^{1/2}} \frac{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \frac{1}{c} \frac{a \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}} - \frac{1}{c} \frac{a \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}} - \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} - \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}} + \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} + \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}} + \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} + \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}} + \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} + \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} + a-c \right) (a-b+c)^{1/2}} + \frac{1}{c} \frac{b \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) + \left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}}{\left( (-4ac+b^2)^{1/2} - a+c \right) (a-b+c)^{1/2}} - \frac{2}{c} \operatorname{arctan} \left( \tan \left( \frac{1}{2}x \right) \right)$$

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

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

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\operatorname{integrate}(\sin(x)^2/(a+b\cos(x)+c\cos(x)^2), x, \operatorname{algorithm}="maxima")$

[Out] 
$$\begin{aligned} & (c \operatorname{integrate}(2*(2*b^2*\cos(3*x))^2 + 2*b^2*\cos(x)^2 + 2*b^2*\sin(3*x))^2 + 2*b^2* \\ & 2*\sin(x)^2 + 4*(2*a^2 + 3*a*c + c^2)*\cos(2*x)^2 + b*c*\cos(x) + 4*(2*a^2 + 3* \\ & *a*c + c^2)*\sin(2*x)^2 + 2*(4*a*b + 3*b*c)*\sin(2*x)*\sin(x) + (b*c*\cos(3*x) \\ & + b*c*\cos(x) + 2*(a*c + c^2)*\cos(2*x))*\cos(4*x) + (4*b^2*\cos(x) + b*c + 2*( \\ & 4*a*b + 3*b*c)*\cos(2*x))*\cos(3*x) + 2*(a*c + c^2 + (4*a*b + 3*b*c)*\cos(x))* \\ & \cos(2*x) + (b*c*\sin(3*x) + b*c*\sin(x) + 2*(a*c + c^2)*\sin(2*x))*\sin(4*x) + \\ & 2*(2*b^2*\sin(x) + (4*a*b + 3*b*c)*\sin(2*x))*\sin(3*x))/(c^3*\cos(4*x)^2 + 4*b \\ & ^2*c*\cos(3*x)^2 + 4*b^2*c*\cos(x)^2 + c^3*\sin(4*x)^2 + 4*b^2*c*\sin(3*x)^2 + \\ & 4*b^2*c*\sin(x)^2 + 4*b*c^2*\cos(x) + c^3 + 4*(4*a^2*c + 4*a*c^2 + c^3)*\cos(2* \\ & *x)^2 + 4*(4*a^2*c + 4*a*c^2 + c^3)*\sin(2*x)^2 + 8*(2*a*b*c + b*c^2)*\sin(2* \\ & *x)*\sin(x) + 2*(2*b*c^2*\cos(3*x) + 2*b*c^2*\cos(x) + c^3 + 2*(2*a*c^2 + c^3)* \\ & \cos(2*x))*\cos(4*x) + 4*(2*b^2*c*\cos(x) + b*c^2 + 2*(2*a*b*c + b*c^2)*\cos(2* \\ & *x))*\cos(3*x) + 4*(2*a*c^2 + c^3 + 2*(2*a*b*c + b*c^2)*\cos(x))*\cos(2*x) + 4* \\ & (b*c^2*\sin(3*x) + b*c^2*\sin(x) + (2*a*c^2 + c^3)*\sin(2*x))*\sin(4*x) + 8*(b^2* \\ & 2*c*\sin(x) + (2*a*b*c + b*c^2)*\sin(2*x))*\sin(3*x)), x) - x)/c \end{aligned}$$

**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]  $\text{int}(\sin(x)^2/(a + b\cos(x) + c\cos(x)^2), x)$

[Out]  $\text{atan}\left(\left(\tan\left(\frac{x}{2}\right)\left(57344a^4b - 57344ab^4 + 8192a^2c^4 + 8192a^4c + 57344b^4c^4 - 57344b^4c - 24576a^5 + 24576b^5 - 24576c^5 + 49152a^2b^3 - 49152a^3b^2 + 147456a^2c^3 + 147456a^3c^2 - 49152b^2c^3 + 49152b^3c^2 + 245760ab^2c^2 - 442368a^2b^2c^2 + 245760a^2b^2c - 163840ab^3c^3 - 32768ab^3c - 163840a^3b^2c\right) + \left(-\left(8a^2c^3 + b\left(-\left(4a^2c - b^2\right)^3\right)\right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2\left(16a^2c^4 + b^4c^2 - 8ab^2c^3\right)\right)^{1/2}\right)\left(32768ab^5 - 253952a^2c^5 - 24576a^5c + 57344b^5c + 57344b^5c - 24576b^6 - 24576c^6 + 16384a^2b^4 - 32768a^3b^3 + 8192a^4b^2 - 638976a^2c^4 - 638976a^3c^3 - 253952a^4c^2 + 24576b^2c^4 - 114688b^3c^3 + 24576b^4c^2 + \left(\tan\left(\frac{x}{2}\right)\left(16384ab^6 - 81920a^2c^6 + 49152b^6c + 49152b^6c - 16384b^7 - 16384c^7 + 16384a^2b^5 - 16384a^3b^4 + 229376a^2c^5 + 491520a^3c^4 + 49152a^4c^3 - 147456a^5c^2 - 32768b^2c^5 - 32768b^5c^2 + 327680ab^3c^3 - 425984ab^4c^2 - 1015808a^2b^2c^4 - 180224a^2b^4c - 983040a^3b^2c^3 - 65536a^3b^3c + 49152a^4b^2c^2 + 98304a^4b^2c + 851968a^2b^2c^3 + 131072a^2b^3c^2 + 393216a^3b^2c^2 + 65536ab^5c^5 + 98304ab^5c\right) + \left(-\left(8a^2c^3 + b\left(-\left(4a^2c - b^2\right)^3\right)\right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2\left(16a^2c^4 + b^4c^2 - 8ab^2c^3\right)\right)^{1/2}\right)\left(24576b^2c^6 - 393216a^2c^6 - 589824a^3c^5 - 393216a^4c^4 - 98304a^5c^3 - 98304a^2c^7 - 49152b^3c^5 + 49152b^5c^3 - 24576b^6c^2 + 98304ab^2c^5 - 344064ab^3c^4 + 98304ab^4c^3 + 49152ab^5c^2 + 589824a^2b^2c^5 + 589824a^3b^2c^4 + 196608a^4b^2c^3 + 147456a^2b^2c^4 - 344064a^2b^3c^3 + 98304a^3b^2c^3 - 49152a^3b^3c^2 + 24576a^4b^2c^2 + 196608ab^5c^6 - \tan\left(\frac{x}{2}\right)\left(-\left(8a^2c^3 + b\left(-\left(4a^2c - b^2\right)^3\right)\right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2\left(16a^2c^4 + b^4c^2 - 8ab^2c^3\right)\right)^{1/2}\right)\left(65536a^2c^8 - 131072a^2c^7 - 262144a^3c^6 + 131072a^4c^5 + 196608a^5c^4 - 16384b^2c^7 + 49152b^3c^6 - 65536b^4c^5 + 65536b^5c^4 - 49152b^6c^3 + 16384b^7c^2 + 294912ab^2c^6 - 409600ab^3c^5 + 376832ab^4c^4 - 114688ab^5c^3 - 16384ab^6c^2 + 589824a^2b^2c^6 + 720896a^3b^2c^5 - 65536a^4b^2c^4 - 655360a^2b^2c^5 + 16384a^2b^3c^4 + 196608a^2b^4c^3 - 16384a^2b^5c^2 - 557056a^3b^2c^4 + 81920a^3b^3c^3 + 16384a^3b^4c^2 - 114688a^4b^2c^3 - 196608ab^5c^7\right)\right)\left(-\left(8a^2c^3 + b\left(-\left(4a^2c - b^2\right)^3\right)\right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2\left(16a^2c^4 + b^4c^2 - 8ab^2c^3\right)\right)^{1/2}\right) + 147456ab^2c^3 - 458752ab^3c^2 + 802816a^2b^2c^3 - 245760a^2b^3c + 557056a^3b^2c^2 - 16384a^3b^2c + 98304a^2b^2c^2 + 425984ab^4c^4 + 106496ab^4c + 122880a^4b^2c)\left(-\left(8a^2c^3 + b\left(-\left(4a^2c - b^2\right)^3\right)\right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2\left(16a^2c^4 + b^4c^2 - 8ab^2c^3\right)\right)^{1/2}\right) + \left(\tan\left(\frac{x}{2}\right)\left(57344a^4b - 57344ab^4 + 8192a^2c^4 + 8192a^4c + 57344b^4c^4 - 57344b^4c - 24576a^5 + 24576b^5 - 24576c^5 + 49152a^2b^3 - 49152a^3b^2 + 147456a^2c^3 + 147456a^3c^2 - 49152b^2c^3 + 49152b^3c^2 + 245760ab^2c^2 - 442368a^2b^2c^2 + 245760a^2b^2c - 163840ab^3c^3 - 32768ab^3c - 163840a^3b^2c\right) - \left(-\left(8a^2c^3 + b\left(-\left(4a^2c - b^2\right)^3\right)\right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2\left(16a^2c^4 + b^4c^2 - 8ab^2c^3\right)\right)^{1/2}\right)\left(32768ab^5 - 253952a^2c^5 - 24576a^5c + 57344b^5c + 57344b^5c - 24576b^6 - 24576c^6 + 16384a^2b^4 - 32768a^3b^3 + 8192a^4b^2 - 638976a^2c^4 - 638976a^3c^3 - 253952a^4c^2 + 24576b^2c^4 - 114688b^3c^3 + 24576b^4c^2 - \left(\tan\left(\frac{x}{2}\right)\left(16384ab^6 - 81920a^2c^6 + 49152b^6c + 49152b^6c - 16384b^7 - 16384c^7 + 16384a^2b^5 - 16384a^3b^4 + 229376a^2c^5 + 491520a^3c^4 + 49152a^4c^3 - 147456a^5c^2 - 32768b^2c^5 - 32768b^5c^2 + 327680ab^3c^3 - 425984ab^4c^2 - 1015808a^2b^2c^4 - 180224a^2b^4c - 983040a^3b^2c^3 - 65536a^3b^3c + 49152a^4b^2c^2 + 98304a^4b^2c + 851968a^2b^2c^3 + 131072a^2b^3c^2 + 393216a^3b^2c^2 + 65536ab^5c^5 + 98304ab^5c\right) - \left(-\left(8a^2c^3 + b\left(-\left(4a^2c - b^2\right)^3\right)\right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2\left(16a^2c^4 + b^4c^2 - 8ab^2c^3\right)\right)^{1/2}\right)\left(24576b^2c^6 - 393216a^2c^6 - 589824a^3c^5 - 393216a^4c^4 - 98304a^5c^3\right)$



$$\begin{aligned}
&^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)}*ii)/((\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*
\end{aligned}$$

$$\begin{aligned}
& b^2c^3 + 49152b^3c^2 + 245760ab^2c^2 - 442368a^2b^2c^2 + 245760a^2b^2c - 163840ab^3c^3 - 32768ab^3c - 163840a^3b^3c) + (- (8a^3c^3 + b^4 - (4a^2c - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / (2(16a^2c^4 + b^4c^2 - 8ab^2c^3))^{1/2} * (32768ab^5 - 253952a^5c - 24576a^5c + 57344b^5c + 57344b^5c - 24576b^6 - 24576c^6 + 16384a^2b^4 - 32768a^3b^3 + 8192a^4b^2 - 638976a^2c^4 - 638976a^3c^3 - 253952a^4c^2 + 24576b^2c^4 - 114688b^3c^3 + 24576b^4c^2 + (\tan(x/2) * (16384ab^6 - 81920a^6c + 49152b^6c + 49152b^6c - 16384b^7 - 16384c^7 + 16384a^2b^5 - 16384a^3b^4 + 229376a^2c^5 + 491520a^3c^4 + 49152a^4c^3 - 147456a^5c^2 - 32768b^2c^5 - 32768b^5c^2 + 327680ab^3c^3 - 425984ab^4c^2 - 1015808a^2b^4c - 180224a^2b^4c - 983040a^3b^3c^3 - 65536a^3b^3c + 49152a^4b^2c + 98304a^4b^2c + 851968a^2b^2c^3 + 131072a^2b^3c^2 + 393216a^3b^2c^2 + 65536ab^5c + 98304ab^5c) + (- (8a^3c^3 + b^4 - (4a^2c - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / (2(16a^2c^4 + b^4c^2 - 8ab^2c^3))^{1/2} * (24576b^2c^6 - 393216a^2c^6 - 589824a^3c^5 - 393216a^4c^4 - 98304a^5c^3 - 98304a^6c^2 - 49152b^3c^5 + 49152b^5c^3 - 24576b^6c^2 + 98304ab^2c^5 - 344064ab^3c^4 + 98304ab^4c^3 + 49152ab^5c^2 + 589824a^2b^2c^5 + 589824a^3b^2c^4 + 196608a^4b^2c^3 + 147456a^2b^2c^4 - 344064a^2b^3c^3 + 98304a^3b^2c^3 - 49152a^3b^3c^2 + 24576a^4b^2c^2 + 196608ab^6c - \tan(x/2) * (- (8a^3c^3 + b^4 - (4a^2c - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / (2(16a^2c^4 + b^4c^2 - 8ab^2c^3))^{1/2} * (65536a^8c - 131072a^2c^7 - 262144a^3c^6 + 131072a^4c^5 + 196608a^5c^4 - 16384b^2c^7 + 49152b^3c^6 - 65536b^4c^5 + 65536b^5c^4 - 49152b^6c^3 + 16384b^7c^2 + 294912ab^2c^6 - 409600ab^3c^5 + 376832ab^4c^4 - 114688ab^5c^3 - 16384ab^6c^2 + 589824a^2b^2c^6 + 720896a^3b^2c^5 - 65536a^4b^2c^4 - 655360a^2b^2c^5 + 16384a^2b^3c^4 + 196608a^2b^4c^3 - 16384a^2b^5c^2 - 557056a^3b^2c^4 + 81920a^3b^3c^3 + 16384a^3b^4c^2 - 114688a^4b^2c^3 - 196608ab^7c) * (- (8a^3c^3 + b^4 - (4a^2c - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / (2(16a^2c^4 + b^4c^2 - 8ab^2c^3))^{1/2} + 147456ab^2c^3 - 458752ab^3c^2 + 802816a^2b^2c^3 - 245760a^2b^3c + 557056a^3b^2c^2 - 16384a^3b^2c + 98304a^2b^2c^2 + 425984ab^4c + 106496ab^4c + 122880a^4b^4c) * (- (8a^3c^3 + b^4 - (4a^2c - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / (2(16a^2c^4 + b^4c^2 - 8ab^2c^3))^{1/2} + 131072ab^3 - 131072a^3b + 262144a^3c + 262144a^3c - 131072b^3c + 131072b^3c + 65536a^4 - 65536b^4 + 65536c^4 + 393216a^2c^2 - 393216ab^2c^2 - 393216a^2b^2c) * (- (8a^3c^3 + b^4 - (4a^2c - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / (2(16a^2c^4 + b^4c^2 - 8ab^2c^3))^{1/2} * 2i + \operatorname{atan}((\tan(x/2) * (57344a^4b - 57344ab^4 + 8192a^4c + 8192a^4c + 57344b^4c - 57344b^4c - 24576a^5 + 24576b^5 - 24576c^5 + 49152a^2b^3 - 49152a^3b^2 + 147456a^2c^3 + 147456a^3c^2 - 49152b^2c^3 + 49152b^3c^2 + 245760ab^2c^2 - 442368a^2b^2c^2 + 245760a^2b^2c - 163840ab^3c^3 - 32768ab^3c - 163840a^3b^3c) + (- (8a^3c^3 + b^4 - (4a^2c - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / (2(16a^2c^4 + b^4c^2 - 8ab^2c^3))^{1/2} * (32768ab^5 - 253952a^5c - 24576a^5c + 57344b^5c + 57344b^5c - 24576b^6 - 24576c^6 + 16384a^2b^4 - 32768a^3b^3 + 8192a^4b^2 - 638976a^2c^4 - 638976a^3c^3 - 253952a^4c^2 + 24576b^2c^4 - 114688b^3c^3 + 24576b^4c^2 + (\tan(x/2) * (16384ab^6 - 81920a^6c + 49152b^6c + 49152b^6c - 16384b^7 - 16384c^7 + 16384a^2b^5 - 16384a^3b^4 + 229376a^2c^5 + 491520a^3c^4 + 49152a^4c^3 - 147456a^5c^2 - 32768b^2c^5 - 32768b^5c^2 + 327680ab^3c^3 - 425984ab^4c^2 - 1015808a^2b^4c - 180224a^2b^4c - 983040a^3b^3c^3 - 65536a^3b^3c + 49152a^4b^2c + 98304a^4b^2c + 851968a^2b^2c^3 + 131072a^2b^3c^2 + 393216a^3b^2c^2 + 65536ab^5c + 98304ab^5c) + (- (8a^3c^3 + b^4 - (4a^2c - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / (2(16a^2c^4 + b^4c^2 - 8ab^2c^3))^{1/2} * (24576b^2c^6 - 393216a^2c^6 - 589824a^3c^5 - 393216a^4c^4 - 98304a^5c^3 - 98304a^6c^2 - 49152b^3c^5 + 49152b^5c^3 - 24576b^6c^2 + 98304ab^2c^5 - 344064ab^3c^4 + 98304ab^4c^3
\end{aligned}$$

$$\begin{aligned}
& 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 - 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 + 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)}*i + (\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 + 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 - 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 + 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)}*i)/((\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
\end{aligned}$$

$$\begin{aligned}
& - 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 - 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 - 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 + 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 + 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 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2
\end{aligned}$$

$$\begin{aligned}
& *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 - 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^
\end{aligned}$$

$$\begin{aligned}
& 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 \\
& \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) - (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 +
\end{aligned}$$

$$\begin{aligned} & 65536*a*b*c^4 + 16384*a*b^4*c - 147456*a^4*b*c) - (32768*a^4*b^2*\tan(x/2)) \\ & /((147456*a^5*c - 49152*a*c^5 - 32768*a*b^5 - 16384*b*c^5 + 16384*b^5*c + 16 \\ & 384*c^6 + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 - 98304*a^2*c^4 + 1 \\ & 63840*a^3*c^3 + 344064*a^4*c^2 - 16384*b^4*c^2 + 98304*a*b^2*c^3 - 98304*a* \\ & b^3*c^2 + 32768*a^2*b*c^3 + 196608*a^2*b^3*c - 196608*a^3*b*c^2 - 229376*a^ \\ & 3*b^2*c - 98304*a^2*b^2*c^2 + 65536*a*b*c^4 + 16384*a*b^4*c - 147456*a^4*b* \\ & c) + (65536*a*b*c^2*\tan(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3 - \\ & 98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a^2* \\ & b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c - (1 \\ & 47456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^2)/ \\ & c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536 \\ & *a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c) + (98304*a*b^2*c*\tan(x/2))/(16384 \\ & 0*a^3*c - 196608*a^3*b - 49152*a*c^3 - 98304*a*b^3 - 16384*b*c^3 + 344064*a \\ & ^4 - 16384*b^4 + 16384*c^4 - 98304*a^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c \\ & + (16384*b^5)/c + (16384*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + \\ & (196608*a^2*b^3)/c - (229376*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3 \\ & *b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2 \\ & *b*c) + (32768*a^2*b*c*\tan(x/2))/(163840*a^3*c - 196608*a^3*b - 49152*a*c^3 \\ & - 98304*a*b^3 - 16384*b*c^3 + 344064*a^4 - 16384*b^4 + 16384*c^4 - 98304*a \\ & ^2*b^2 - 98304*a^2*c^2 + (147456*a^5)/c + (16384*b^5)/c + (16384*a*b^4)/c - \\ & (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (196608*a^2*b^3)/c - (229376*a^3*b^ \\ & 2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 + 65 \\ & 536*a*b*c^2 + 98304*a*b^2*c + 32768*a^2*b*c))/c \end{aligned}$$

**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

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

Optimal. Leaf size=326

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

[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}

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

Antiderivative was successfully verified.

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

[Out]  $(-2*b*c*(1 + (b^2 - 2*c*(a + c))/(b*\text{Sqrt}[b^2 - 4*a*c]))*\text{ArcTan}[(\text{Sqrt}[b - 2*c - \text{Sqrt}[b^2 - 4*a*c]]*\text{Tan}[x/2])/(\text{Sqrt}[b + 2*c - \text{Sqrt}[b^2 - 4*a*c]])]/((a - b + c)*(a + b + c)*\text{Sqrt}[b - 2*c - \text{Sqrt}[b^2 - 4*a*c]]*\text{Sqrt}[b + 2*c - \text{Sqrt}[b^2 - 4*a*c]]) - (2*b*c*(1 - (b^2 - 2*c*(a + c))/(b*\text{Sqrt}[b^2 - 4*a*c]))*\text{ArcTan}[(\text{Sqrt}[b - 2*c + \text{Sqrt}[b^2 - 4*a*c]]*\text{Tan}[x/2])/(\text{Sqrt}[b + 2*c + \text{Sqrt}[b^2 - 4*a*c]])]/((a - b + c)*(a + b + c)*\text{Sqrt}[b - 2*c + \text{Sqrt}[b^2 - 4*a*c]]*\text{Sqrt}[b + 2*c + \text{Sqrt}[b^2 - 4*a*c]]) - \text{Sin}[x]/(2*(a + b + c)*(1 - \text{Cos}[x])) + \text{Sin}[x]/(2*(a - b + c)*(1 + \text{Cos}[x]))$

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[ExpandTrig[(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

$$\begin{aligned} \int \frac{\csc^2(x)}{a + b \cos(x) + c \cos^2(x)} dx &= \int \left( -\frac{1}{2(a+b+c)(-1+\cos(x))} + \frac{1}{2(a-b+c)(1+\cos(x))} + \frac{-b^2}{(a-b+c)(a+b+c)} \right) dx \\ &= \frac{\int \frac{1}{1+\cos(x)} dx}{2(a-b+c)} - \frac{\int \frac{1}{-1+\cos(x)} dx}{2(a+b+c)} + \frac{\int \frac{-b^2 \left(1 - \frac{c(a+c)}{b^2}\right) - bc \cos(x)}{a+b \cos(x) + c \cos^2(x)} dx}{(a-b+c)(a+b+c)} \\ &= -\frac{\sin(x)}{2(a+b+c)(1-\cos(x))} + \frac{\sin(x)}{2(a-b+c)(1+\cos(x))} - \frac{\left(c \left(b + \frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\right) \int \frac{1}{a+b \cos(x) + c \cos^2(x)} dx}{(a-b+c)} \\ &= -\frac{\sin(x)}{2(a+b+c)(1-\cos(x))} + \frac{\sin(x)}{2(a-b+c)(1+\cos(x))} - \frac{\left(2c \left(b + \frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right)\right) \operatorname{Sqrt}\left[\frac{a+b \cos(x) + c \cos^2(x)}{b^2-4ac}\right]}{\sqrt{b^2-4ac}} \\ &= -\frac{2c \left(b + \frac{b^2-2c(a+c)}{\sqrt{b^2-4ac}}\right) \tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{(a-b+c)(a+b+c)\sqrt{b-2c-\sqrt{b^2-4ac}}\sqrt{b+2c-\sqrt{b^2-4ac}}} - \frac{b^2}{(a-b+c)(a+b+c)} \end{aligned}$$

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

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

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 + 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]]) - (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] 
$$\begin{aligned} & 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)}* \\ & \operatorname{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)}* \\ & \operatorname{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)}* \\ & \operatorname{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)})* \\ & 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)}* \\ & \operatorname{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)}* \\ & \operatorname{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)}* \\ & \operatorname{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+b+c)/(a-b+c)^2/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}* \\ & \operatorname{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)}) \end{aligned}$$

$$\begin{aligned} & *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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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 \end{aligned}$$

**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] 
$$\begin{aligned} & -(2*b*\cos(2*x)*\sin(x) + ((a^2 - b^2 + 2*a*c + c^2)*\cos(2*x)^2 + (a^2 - b^2 \\ & + 2*a*c + c^2)*\sin(2*x)^2 + a^2 - b^2 + 2*a*c + c^2 - 2*(a^2 - b^2 + 2*a*c \\ & + c^2)*\cos(2*x))*\operatorname{integrate}(2*(2*b^2*c*\cos(3*x)^2 + 2*b^2*c*\cos(x)^2 + 2*b^2 \\ & *c*\sin(3*x)^2 + 2*b^2*c*\sin(x)^2 + b*c^2*\cos(x) + 4*(2*a*b^2 - 3*a*c^2 - c^3 \\ & - (2*a^2 - b^2)*c)*\cos(2*x)^2 + 4*(2*a*b^2 - 3*a*c^2 - c^3 - (2*a^2 - b^2 \\ & )*c)*\sin(2*x)^2 + 2*(2*b^3 - b*c^2)*\sin(2*x)*\sin(x) + (b*c^2*\cos(3*x) + b*c \\ & ^2*\cos(x) + 2*(b^2*c - a*c^2 - c^3)*\cos(2*x))*\cos(4*x) + (4*b^2*c*\cos(x) + \\ & b*c^2 + 2*(2*b^3 - b*c^2)*\cos(2*x))*\cos(3*x) + 2*(b^2*c - a*c^2 - c^3 + (2* \\ & b^3 - b*c^2)*\cos(x))*\cos(2*x) + (b*c^2*\sin(3*x) + b*c^2*\sin(x) + 2*(b^2*c - \\ & a*c^2 - c^3)*\sin(2*x))*\sin(4*x) + 2*(2*b^2*c*\sin(x) + (2*b^3 - b*c^2)*\sin( \\ & 2*x))*\sin(3*x))/(2*a*c^3 + c^4 + (a^2 - b^2)*c^2 + (2*a*c^3 + c^4 + (a^2 - \\ & b^2)*c^2)*\cos(4*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*\cos(3*x)^2 + \\ & 4*(4*a^4 - 4*a^2*b^2 + 6*a*c^3 + c^4 + (13*a^2 - b^2)*c^2 + 4*(3*a^3 - a*b \\ & ^2)*c)*\cos(2*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*\cos(x)^2 + (2*a \\ & *c^3 + c^4 + (a^2 - b^2)*c^2)*\sin(4*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b \\ & ^2*c^2)*\sin(3*x)^2 + 4*(4*a^4 - 4*a^2*b^2 + 6*a*c^3 + c^4 + (13*a^2 - b^2)* \\ & c^2 + 4*(3*a^3 - a*b^2)*c)*\sin(2*x)^2 + 8*(2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + \\ & b*c^3 + (5*a^2*b - b^3)*c)*\sin(2*x)*\sin(x) + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + \\ & b^2*c^2)*\sin(x)^2 + 2*(2*a*c^3 + c^4 + (a^2 - b^2)*c^2 + 2*(2*a*b*c^2 + b* \\ & c^3 + (a^2*b - b^3)*c)*\cos(3*x) + 2*(4*a*c^3 + c^4 + (5*a^2 - b^2)*c^2 + 2* \\ & (a^3 - a*b^2)*c)*\cos(2*x) + 2*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*\cos(x) \\ & * \cos(4*x) + 4*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c + 2*(2*a^3*b - 2*a*b^3 + \end{aligned}$$

$$4*a*b*c^2 + b*c^3 + (5*a^2*b - b^3)*c)*\cos(2*x) + 2*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*\cos(x))*\cos(3*x) + 4*(4*a*c^3 + c^4 + (5*a^2 - b^2)*c^2 + 2*(a^3 - a*b^2)*c + 2*(2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + b*c^3 + (5*a^2*b - b^3)*c)*\cos(x))*\cos(2*x) + 4*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*\cos(x) + 4*((2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*\sin(3*x) + (4*a*c^3 + c^4 + (5*a^2 - b^2)*c^2 + 2*(a^3 - a*b^2)*c)*\sin(2*x) + (2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*\sin(x))*\sin(4*x) + 8*((2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + b*c^3 + (5*a^2*b - b^3)*c)*\sin(2*x) + (a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*\sin(x))*\sin(3*x)), x) - 2*(b*\cos(x) - a - c)*\sin(2*x) - 2*b*\sin(x))/((a^2 - b^2 + 2*a*c + c^2)*\cos(2*x)^2 + (a^2 - b^2 + 2*a*c + c^2)*\sin(2*x)^2 + a^2 - b^2 + 2*a*c + c^2 - 2*(a^2 - b^2 + 2*a*c + c^2)*\cos(2*x))$$

**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]  $\text{int}(1/(\sin(x)^2*(a + b*\cos(x) + c*\cos(x)^2)),x)$

[Out]  $\text{atan}(\left(\left(\left(-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)\right)^{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}\right)/(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))\right)^{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)*\left(-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}\right)/(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))\right)^{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 + 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^$

$$\begin{aligned}
& 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 \\
& - 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
\end{aligned}$$

$$\begin{aligned}
& \sqrt{-18ab^2c^5 + 24a^2b^4c^3 + 3b^3c^4(-4ac - b^2)^3} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(-4ac - b^2)^3 \\
& \sqrt{-10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3} + 6ab^3c^3(-4ac - b^2)^3 \\
& \sqrt{-4ab^3c(-4ac - b^2)^3} / (2(3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c^5 \\
& + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8ab^2c^7 + 30ab^4c^5 - 36ab^6c^3 - 36a^3b^6c + 30a^5b^4c \\
& *c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14ab^8c)) \\
& \sqrt{-10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3} + 6ab^3c^3(-4ac - b^2)^3 - 4ab^3c(-4ac - b^2)^3 \\
& \sqrt{-10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3} + 6ab^3c^3(-4ac - b^2)^3 - 4ab^3c(-4ac - b^2)^3} / (2(3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 \\
& + 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8ab^2c^7 + 30ab^4c^5 - 36ab^6c^3 - 36a^3b^6c + 30a^5b^4c \\
& - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14ab^8c)) \\
& \sqrt{128a^3c^{13} - 64ab^{13} - 32b^{13}c + 32b^{14} - 96a^2b^{12} + 256a^3b^{11} + 64a^4b^{10} - 384a^5b^9 + 64a^6b^8 + 256a^7b^7 - 96a^8b^6 - 64a^9b^5 + 32a^{10}b^4 + 1408a^2c^{12} + 7040a^3c^{11} + 21120a^4c^{10} + 42240a^5c^9 + 59136a^6c^8 + 59136a^7c^7 + 42240a^8c^6 + 21120a^9c^5 + 7040a^{10}c^4 + 1408a^{11}c^3 + 128a^{12}c^2 - 32b^2c^{12} + 96b^3c^{11} + 64b^4c^{10} - 416b^5c^9 + 96b^6c^8 + 704b^7c^7 - 384b^8c^6 - 576b^9c^5 + 416b^{10}c^4 + 224b^{11}c^3 - 192b^{12}c^2 - \tan(x/2)(-8a^7c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5(-4ac - b^2)^3)} \\
& \sqrt{-10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(-4ac - b^2)^3} \\
& \sqrt{-10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3} + 6ab^3c^3(-4ac - b^2)^3} - 4ab^3c(-4ac - b^2)^3} / (2(3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 \\
& + 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8ab^2c^7 + 30ab^4c^5 - 36ab^6c^3 - 36a^3b^6c + 30a^5b^4c \\
& - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14ab^8c)) \\
& \sqrt{64ab^{14} - 256a^3c^{14} + 256a^{14}c - 64b^{14}c - 128a^2b^{13} - 256a^3b^{12} + 640a^4b^{11} + 320a^5b^{10} - 1280a^6b^9 + 1280a^8b^7 - 320a^9b^6 - 640a^{10}b^5 + 256a^{11}b^4 + 128a^{12}b^3 - 64a^{13}b^2 - 2816a^2c^{13} - 13824a^3c^{12} - 39424a^4c^{11} - 70400a^5c^{10} - 76032a^6c^9 - 33792a^7c^8 + 33792a^8c^7 + 76032a^9c^6 + 70400a^{10}c^5 + 39424a^{11}c^4 + 13824a^{12}c^3 + 2816a^{13}c^2 + 64b^2c^{13} - 128b^3c^{12} - 256b^4c^{11} + 640b^5c^{10} + 320b^6c^9 - 1280b^7c^8 + 1280b^9c^6 - 320b^{10}c^5 - 640b^{11}c^4 + 256b^{12}c^3 + 128b^{13}c^2 + 1728ab^2c^{12} - 3840ab^3c^{11} - 3584ab^4c^{10} + 10240ab^5c^9 + 2240ab^6c^8 - 12800ab^7c^7 + 1280ab^8c^6 + 7680ab^9c^5 - 1984ab^{10}c^4 - 1792ab^{11}c^3 + 512ab^{12}c^2 + 5120a^2b^2c^{12} - 512a^2b^{12}c + 22528a^3b^2c^{11} + 1792a^3b^{11}c + 56320a^4b^2c^{10} + 1984a^4b^{10}c + 84480a^5b^2c^9 - 7680a^5b^9c + 67584a^6b^2c^8 - 1280a^6b^8c + 12800a^7b^7c - 67584a^8b^2c^6 - 2240a^8b^6c - 84480a^9b^2c^5 - 10240a^9b^5c - 56320a^{10}b^2c^4 + 3584a^{10}b^4c - 22528a^{11}b^2c^3 + 3840a^{11}b^3c - 5120a^{12}b^2c^2 - 1728a^{12}b^2c + 12672a^2b^2c^{11} - 26112a^2b^3c^{10} - 17920a^2b^4c^9 + 48000a^2b^5c^8 + 6400a^2b^6c^7 - 38400a^2b^7c^6 + 3840a^2b^8c^5 + 11520a^2b^9c^4 - 1664a^2b^{10}c^3 + 45696a^3b^2c^{10} - 83200a^3b^3c^9 - 44800a^3b^4c^8 + 102400a^3b^5c^7 + 8960a^3b^6c^6 - 43520a^3b^7c^5 + 2560a^3b^8c^4 + 1664a^3b^{10}c^2 + 94400a^4b^
\end{aligned}$$

$$\begin{aligned}
& 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^
\end{aligned}$$

$$\begin{aligned}
& 3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + \\
& 14ab^8c))^{(1/2)} \cdot i) / (512a^c^{11} + 64c^{12} + ((-(8a^c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5(-(4a^c - b^2)^3)^{(1/2)} - 2b^2c^6 + 3 \\
& b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^c^4(-(4a^c - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(- \\
& -(4a^c - b^2)^3)^{(1/2)} - 10ab^6c + 3a^2b^c^2(-(4a^c - b^2)^3)^{(1/2)} \\
& + 6ab^c^3(-(4a^c - b^2)^3)^{(1/2)} - 4ab^3c(-(4a^c - b^2)^3)^{(1/2)}) \\
& / (2(3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240 \\
& a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - \\
& 3b^6c^4 + 3b^8c^2 - 8ab^2c^7 + 30ab^4c^5 - 36ab^6c^3 - 36a^3b^6c \\
& b^6c + 30a^5b^4c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4 \\
& b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14ab^8c))^{(1/2)} \cdot (128a^c^{13} - 64ab^{13} - 32b^{13}c + 32b^{14} - 96a^2b^{12} + 256a^3b^{11} + 64a^4b^{10} - 384a^5b^9 + 64a^6b^8 + 256a^7b^7 - 96a^8b^6 - 64a^9b^5 + 3 \\
& 2a^{10}b^4 + 1408a^2c^{12} + 7040a^3c^{11} + 21120a^4c^{10} + 42240a^5c^9 \\
& + 59136a^6c^8 + 59136a^7c^7 + 42240a^8c^6 + 21120a^9c^5 + 7040a^{10}c^4 + 1408a^{11}c^3 + 128a^{12}c^2 - 32b^2c^{12} + 96b^3c^{11} + 64b^4c^{10} - 416b^5c^9 + 96b^6c^8 + 704b^7c^7 - 384b^8c^6 - 576b^9c^5 + \\
& 416b^{10}c^4 + 224b^{11}c^3 - 192b^{12}c^2 + \tan(x/2) \cdot (-(8a^c^7 + b^8 + 24 \\
& a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5(-(4a^c - b^2)^3)^{(1/2)} - 2b^2c^6 \\
& + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 24ab^4c^3 + 3b^c^4(-(4a^c - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2(- \\
& -(4a^c - b^2)^3)^{(1/2)} - 10ab^6c + 3a^2b^c^2(-(4a^c - b^2)^3)^{(1/2)} + 6ab^c^3(-(4a^c - b^2)^3)^{(1/2)} - 4ab^3c(-(4a^c - b^2)^3)^{(1/2)}) / (2(3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 \\
& + 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - \\
& 3b^6c^4 + 3b^8c^2 - 8ab^2c^7 + 30ab^4c^5 - 36ab^6c^3 - 36 \\
& a^3b^6c + 30a^5b^4c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - \\
& 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 15 \\
& 9a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14ab^8c))^{(1/2)} \cdot (64a \\
& ab^{14} - 256a^c^{14} + 256a^{14}c - 64b^{14}c - 128a^2b^{13} - 256a^3b^{12} \\
& + 640a^4b^{11} + 320a^5b^{10} - 1280a^6b^9 + 1280a^8b^7 - 320a^9b^6 - \\
& 640a^{10}b^5 + 256a^{11}b^4 + 128a^{12}b^3 - 64a^{13}b^2 - 2816a^2c^{13} - \\
& 13824a^3c^{12} - 39424a^4c^{11} - 70400a^5c^{10} - 76032a^6c^9 - 33792a \\
& ^7c^8 + 33792a^8c^7 + 76032a^9c^6 + 70400a^{10}c^5 + 39424a^{11}c^4 + \\
& 13824a^{12}c^3 + 2816a^{13}c^2 + 64b^2c^{13} - 128b^3c^{12} - 256b^4c^{11} \\
& + 640b^5c^{10} + 320b^6c^9 - 1280b^7c^8 + 1280b^9c^6 - 320b^{10}c^5 - \\
& 640b^{11}c^4 + 256b^{12}c^3 + 128b^{13}c^2 + 1728ab^2c^{12} - 3840ab^3c^{11} \\
& - 3584ab^4c^{10} + 10240ab^5c^9 + 2240ab^6c^8 - 12800ab^7c^7 \\
& + 1280ab^8c^6 + 7680ab^9c^5 - 1984ab^{10}c^4 - 1792ab^{11}c^3 + 51 \\
& 2ab^{12}c^2 + 5120a^2b^c^{12} - 512a^2b^{12}c + 22528a^3b^c^{11} + 1792a \\
& ^3b^{11}c + 56320a^4b^c^{10} + 1984a^4b^{10}c + 84480a^5b^c^9 - 7680a^5 \\
& b^9c + 67584a^6b^c^8 - 1280a^6b^8c + 12800a^7b^7c - 67584a^8b^c^6 - \\
& 2240a^8b^6c - 84480a^9b^c^5 - 10240a^9b^5c - 56320a^{10}b^c^4 \\
& + 3584a^{10}b^4c - 22528a^{11}b^c^3 + 3840a^{11}b^3c - 5120a^{12}b^c^2 - \\
& 1728a^{12}b^2c + 12672a^2b^2c^{11} - 26112a^2b^3c^{10} - 17920a^2b^4c^9 \\
& + 48000a^2b^5c^8 + 6400a^2b^6c^7 - 38400a^2b^7c^6 + 3840a^2b^8c^5 \\
& + 11520a^2b^9c^4 - 1664a^2b^{10}c^3 + 45696a^3b^2c^{10} - 83200a^3b^3c^9 \\
& - 44800a^3b^4c^8 + 102400a^3b^5c^7 + 8960a^3b^6c^6 - 4 \\
& 3520a^3b^7c^5 + 2560a^3b^8c^4 + 1664a^3b^{10}c^2 + 94400a^4b^2c^9 \\
& - 144000a^4b^3c^8 - 58880a^4b^4c^7 + 98560a^4b^5c^6 + 4480a^4b^6c^5 \\
& - 2560a^4b^8c^3 - 11520a^4b^9c^2 + 111168a^5b^2c^8 - 124416a^5b^3c^7 \\
& - 28672a^5b^4c^6 - 4480a^5b^6c^4 + 43520a^5b^7c^3 - 38 \\
& 40a^5b^8c^2 + 51456a^6b^2c^7 + 28672a^6b^4c^5 - 98560a^6b^5c^4 \\
& - 8960a^6b^6c^3 + 38400a^6b^7c^2 - 51456a^7b^2c^6 + 124416a^7b^3 \\
& c^5 + 58880a^7b^4c^4 - 102400a^7b^5c^3 - 6400a^7b^6c^2 - 111168a^8b^2c^5 \\
& + 144000a^8b^3c^4 + 44800a^8b^4c^3 - 48000a^8b^5c^2 - 9 \\
& 4400a^9b^2c^4 + 83200a^9b^3c^3 + 17920a^9b^4c^2 - 45696a^{10}b^2c^4
\end{aligned}$$



$$\begin{aligned}
&^3 + 26112a^{10}b^3c^2 - 12672a^{11}b^2c^2 + 512a^*b^*c^{13} - 512a^{13}b^*c) \\
&- 608a^*b^2c^{11} + 2624a^*b^3c^{10} + 224a^*b^4c^9 - 6208a^*b^5c^8 + 2112 \\
&*a^*b^6c^7 + 6784a^*b^7c^6 - 3520a^*b^8c^5 - 3584a^*b^9c^4 + 2080a^*b^{10} \\
&*c^3 + 832a^*b^{11}c^2 - 3840a^2*b^*c^{11} + 992a^2*b^{11}c - 17280a^3*b^*c^{10} \\
&+ 992a^3*b^{10}c - 46080a^4*b^*c^9 - 3136a^4*b^9c - 80640a^5*b^*c^8 - 32 \\
&0a^5*b^8c - 96768a^6*b^*c^7 + 3776a^6*b^7c - 80640a^7*b^*c^6 - 832a^7* \\
&b^6c - 46080a^8*b^*c^5 - 1952a^8*b^5c - 17280a^9*b^*c^4 + 736a^9*b^4c \\
&- 3840a^{10}b^*c^3 + 352a^{10}b^3c - 384a^{11}b^*c^2 - 160a^{11}b^2c - 4192 \\
&*a^2*b^2c^{10} + 17888a^2*b^3c^9 + 288a^2*b^4c^8 - 30080a^2*b^5c^7 + 8 \\
&768a^2*b^6c^6 + 22848a^2*b^7c^5 - 8768a^2*b^8c^4 - 7808a^2*b^9c^3 + \\
&2592a^2*b^{10}c^2 - 15648a^3*b^2c^9 + 60160a^3*b^3c^8 + 1152a^3*b^4c \\
&^7 - 73472a^3*b^5c^6 + 15424a^3*b^6c^5 + 37888a^3*b^7c^4 - 8960a^3*b \\
&^8c^3 - 7552a^3*b^9c^2 - 36672a^4*b^2c^8 + 120512a^4*b^3c^7 + 5376a \\
&^4*b^4c^6 - 104384a^4*b^5c^5 + 12800a^4*b^6c^4 + 34112a^4*b^7c^3 - 3 \\
&712a^4*b^8c^2 - 57792a^5*b^2c^7 + 155008a^5*b^3c^6 + 12096a^5*b^4c^5 \\
&- 90496a^5*b^5c^4 + 3776a^5*b^6c^3 + 16512a^5*b^7c^2 - 63168a^6*b^ \\
&2c^6 + 131264a^6*b^3c^5 + 14784a^6*b^4c^4 - 47488a^6*b^5c^3 - 1088a^ \\
&^6*b^6c^2 - 48192a^7*b^2c^5 + 72448a^7*b^3c^4 + 10368a^7*b^4c^3 - 14 \\
&080a^7*b^5c^2 - 25248a^8*b^2c^4 + 24800a^8*b^3c^3 + 4032a^8*b^4c^2 \\
&- 8672a^9*b^2c^3 + 4672a^9*b^3c^2 - 1760a^{10}b^2c^2 - 384a^*b^*c^{12} - \\
&416a^*b^{12}c) + \tan(x/2)*(32a^*b^{12} - 512a^*c^{12} + 128b^*c^{12} + 96b^{12}c - \\
&32b^{13} - 64c^{13} + 96a^2*b^{11} - 96a^3*b^{10} - 96a^4*b^9 + 96a^5*b^8 + \\
&32a^6*b^7 - 32a^7*b^6 - 1728a^2*c^{11} - 3072a^3*c^{10} - 2688a^4*c^9 + 26 \\
&88a^6*c^7 + 3072a^7*c^6 + 1728a^8*c^5 + 512a^9*c^4 + 64a^{10}c^3 + 160* \\
&b^2c^{11} - 544b^3c^{10} + 64b^4c^9 + 896b^5c^8 - 608b^6c^7 - 672b^7* \\
&c^6 + 800b^8c^5 + 160b^9c^4 - 448b^{10}c^3 + 64b^{11}c^2 + 480a^*b^2c^ \\
&10 - 4352a^*b^3c^9 + 2560a^*b^4c^8 + 5248a^*b^5c^7 - 5664a^*b^6c^6 - 22 \\
&40a^*b^7c^5 + 4320a^*b^8c^4 - 256a^*b^9c^3 - 1216a^*b^{10}c^2 + 5632a^2* \\
&b^*c^{10} - 672a^2*b^{10}c + 14336a^3*b^*c^9 - 768a^3*b^9c + 23296a^4*b^*c^8 \\
&+ 1248a^4*b^8c + 25088a^5*b^*c^7 + 576a^5*b^7c + 17920a^6*b^*c^6 - 864 \\
&*a^6*b^6c + 8192a^7*b^*c^5 - 128a^7*b^5c + 2176a^8*b^*c^4 + 192a^8*b^4* \\
&c + 256a^9*b^*c^3 - 1408a^2*b^2c^9 - 14720a^2*b^3c^8 + 13440a^2*b^4c^ \\
&7 + 11904a^2*b^5c^6 - 16800a^2*b^6c^5 - 1696a^2*b^7c^4 + 7168a^2*b^8 \\
&*c^3 - 1216a^2*b^9c^2 - 9856a^3*b^2c^8 - 27392a^3*b^3c^7 + 31232a^3* \\
&b^4c^6 + 12928a^3*b^5c^5 - 23264a^3*b^6c^4 + 1152a^3*b^7c^3 + 4800a \\
&^3*b^8c^2 - 22848a^4*b^2c^7 - 30400a^4*b^3c^6 + 39680a^4*b^4c^5 + 62 \\
&72a^4*b^5c^4 - 16544a^4*b^6c^3 + 1824a^4*b^7c^2 - 29120a^5*b^2c^6 - \\
&20224a^5*b^3c^5 + 29184a^5*b^4c^4 + 384a^5*b^5c^3 - 5856a^5*b^6c^2 \\
&- 22400a^6*b^2c^5 - 7552a^6*b^3c^4 + 12160a^6*b^4c^3 - 640a^6*b^5c \\
&^2 - 10368a^7*b^2c^4 - 1280a^7*b^3c^3 + 2560a^7*b^4c^2 - 2656a^8*b^2 \\
&*c^3 - 32a^8*b^3c^2 - 288a^9*b^2c^2 + 1280a^*b^*c^{11} + 320a^*b^{11}c)) * (- \\
&(8a^*c^7 + b^8 + 24a^2*c^6 + 24a^3*c^5 + 8a^4*c^4 + b^5*(-(4a^*c - b^2)^ \\
&3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^*b^2c^5 + 24a^*b^4c^3 \\
&+ 3b^*c^4*(-(4a^*c - b^2)^3)^{(1/2)} - 54a^2*b^2c^4 + 33a^2*b^4c^2 - 38a \\
&^3*b^2c^3 - 3b^3c^2*(-(4a^*c - b^2)^3)^{(1/2)} - 10a^*b^6c + 3a^2*b^*c^2* \\
&(-(4a^*c - b^2)^3)^{(1/2)} + 6a^*b^*c^3*(-(4a^*c - b^2)^3)^{(1/2)} - 4a^*b^3*c*( \\
&- (4a^*c - b^2)^3)^{(1/2)}) / (2*(3a^2*b^8 - b^{10} - 3a^4*b^6 + a^6*b^4 + 16a^ \\
&2*c^8 + 96a^3*c^7 + 240a^4*c^6 + 320a^5*c^5 + 240a^6*c^4 + 96a^7*c^3 + \\
&16a^8*c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8a^*b^2c^7 + 30a^*b^4c^5 \\
&- 36a^*b^6c^3 - 36a^3*b^6c + 30a^5*b^4c - 8a^7*b^2c - 96a^2*b^2c^6 \\
&+ 159a^2*b^4c^4 - 82a^2*b^6c^2 - 312a^3*b^2c^5 + 260a^3*b^4c^3 - 4 \\
&48a^4*b^2c^4 + 159a^4*b^4c^2 - 312a^5*b^2c^3 - 96a^6*b^2c^2 + 14a^* \\
&b^8c))^{(1/2)} + ((- (8a^*c^7 + b^8 + 24a^2*c^6 + 24a^3*c^5 + 8a^4*c^4 + \\
&b^5*(-(4a^*c - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^*b^2 \\
&*c^5 + 24a^*b^4c^3 + 3b^*c^4*(-(4a^*c - b^2)^3)^{(1/2)} - 54a^2*b^2c^4 + 3 \\
&3a^2*b^4c^2 - 38a^3*b^2c^3 - 3b^3c^2*(-(4a^*c - b^2)^3)^{(1/2)} - 10a^* \\
&b^6c + 3a^2*b^*c^2*(-(4a^*c - b^2)^3)^{(1/2)} + 6a^*b^*c^3*(-(4a^*c - b^2)^3) \\
&^{(1/2)} - 4a^*b^3*c*(-(4a^*c - b^2)^3)^{(1/2)}) / (2*(3a^2*b^8 - b^{10} - 3a^4*b \\
&^6 + a^6*b^4 + 16a^2*c^8 + 96a^3*c^7 + 240a^4*c^6 + 320a^5*c^5 + 240a^
\end{aligned}$$

$$\begin{aligned}
& 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^{11} \\
& *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^{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 - 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
\end{aligned}$$

$$\begin{aligned}
&^9 + 288a^2b^4c^8 - 30080a^2b^5c^7 + 8768a^2b^6c^6 + 22848a^2b^7 \\
&*c^5 - 8768a^2b^8c^4 - 7808a^2b^9c^3 + 2592a^2b^{10}c^2 - 15648a^3* \\
&b^2c^9 + 60160a^3b^3c^8 + 1152a^3b^4c^7 - 73472a^3b^5c^6 + 15424* \\
&a^3b^6c^5 + 37888a^3b^7c^4 - 8960a^3b^8c^3 - 7552a^3b^9c^2 - 366 \\
&72a^4b^2c^8 + 120512a^4b^3c^7 + 5376a^4b^4c^6 - 104384a^4b^5c^5 \\
&+ 12800a^4b^6c^4 + 34112a^4b^7c^3 - 3712a^4b^8c^2 - 57792a^5b^2 \\
&*c^7 + 155008a^5b^3c^6 + 12096a^5b^4c^5 - 90496a^5b^5c^4 + 3776a^ \\
&5b^6c^3 + 16512a^5b^7c^2 - 63168a^6b^2c^6 + 131264a^6b^3c^5 + 14 \\
&784a^6b^4c^4 - 47488a^6b^5c^3 - 1088a^6b^6c^2 - 48192a^7b^2c^5 \\
&+ 72448a^7b^3c^4 + 10368a^7b^4c^3 - 14080a^7b^5c^2 - 25248a^8b^2 \\
&*c^4 + 24800a^8b^3c^3 + 4032a^8b^4c^2 - 8672a^9b^2c^3 + 4672a^9b \\
&^3c^2 - 1760a^{10}b^2c^2 - 384a*b*c^{12} - 416a*b^{12}c) - \tan(x/2)*(32a* \\
&b^{12} - 512a*c^{12} + 128b*c^{12} + 96b^{12}c - 32b^{13} - 64c^{13} + 96a^2b^1 \\
&1 - 96a^3b^{10} - 96a^4b^9 + 96a^5b^8 + 32a^6b^7 - 32a^7b^6 - 1728* \\
&a^2c^{11} - 3072a^3c^{10} - 2688a^4c^9 + 2688a^6c^7 + 3072a^7c^6 + 172 \\
&8a^8c^5 + 512a^9c^4 + 64a^{10}c^3 + 160b^2c^{11} - 544b^3c^{10} + 64b^ \\
&4c^9 + 896b^5c^8 - 608b^6c^7 - 672b^7c^6 + 800b^8c^5 + 160b^9c^4 \\
&- 448b^{10}c^3 + 64b^{11}c^2 + 480a*b^2c^{10} - 4352a*b^3c^9 + 2560a*b^ \\
&4c^8 + 5248a*b^5c^7 - 5664a*b^6c^6 - 2240a*b^7c^5 + 4320a*b^8c^4 - \\
&256a*b^9c^3 - 1216a*b^{10}c^2 + 5632a^2b*c^{10} - 672a^2b^{10}c + 14336 \\
&a^3b*c^9 - 768a^3b^9c + 23296a^4b*c^8 + 1248a^4b^8c + 25088a^5b \\
&*c^7 + 576a^5b^7c + 17920a^6b*c^6 - 864a^6b^6c + 8192a^7b*c^5 - 1 \\
&28a^7b^5c + 2176a^8b*c^4 + 192a^8b^4c + 256a^9b*c^3 - 1408a^2b^ \\
&2c^9 - 14720a^2b^3c^8 + 13440a^2b^4c^7 + 11904a^2b^5c^6 - 16800a \\
&^2b^6c^5 - 1696a^2b^7c^4 + 7168a^2b^8c^3 - 1216a^2b^9c^2 - 9856* \\
&a^3b^2c^8 - 27392a^3b^3c^7 + 31232a^3b^4c^6 + 12928a^3b^5c^5 - 2 \\
&3264a^3b^6c^4 + 1152a^3b^7c^3 + 4800a^3b^8c^2 - 22848a^4b^2c^7 \\
&- 30400a^4b^3c^6 + 39680a^4b^4c^5 + 6272a^4b^5c^4 - 16544a^4b^6* \\
&c^3 + 1824a^4b^7c^2 - 29120a^5b^2c^6 - 20224a^5b^3c^5 + 29184a^5* \\
&b^4c^4 + 384a^5b^5c^3 - 5856a^5b^6c^2 - 22400a^6b^2c^5 - 7552a^6 \\
&*b^3c^4 + 12160a^6b^4c^3 - 640a^6b^5c^2 - 10368a^7b^2c^4 - 1280a \\
&^7b^3c^3 + 2560a^7b^4c^2 - 2656a^8b^2c^3 - 32a^8b^3c^2 - 288a^9 \\
&*b^2c^2 + 1280a*b*c^{11} + 320a*b^{11}c)) * (- (8a*c^7 + b^8 + 24a^2c^6 + 2 \\
&4a^3c^5 + 8a^4c^4 + b^5 * (- (4a*c - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^ \\
&4 - 3b^6c^2 - 18a*b^2c^5 + 24a*b^4c^3 + 3b*c^4 * (- (4a*c - b^2)^3)^{(1 \\
&/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 * (- (4a*c \\
&- b^2)^3)^{(1/2)} - 10a*b^6c + 3a^2b*c^2 * (- (4a*c - b^2)^3)^{(1/2)} + 6a* \\
&b*c^3 * (- (4a*c - b^2)^3)^{(1/2)} - 4a*b^3c * (- (4a*c - b^2)^3)^{(1/2)}) / (2 * (3* \\
&a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^ \\
&6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c \\
&^4 + 3b^8c^2 - 8a*b^2c^7 + 30a*b^4c^5 - 36a*b^6c^3 - 36a^3b^6c + \\
&30a^5b^4c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6 \\
&*c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^ \\
&2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14a*b^8c))^{(1/2)} + 1792a^2c^{10} \\
&+ 3584a^3c^9 + 4480a^4c^8 + 3584a^5c^7 + 1792a^6c^6 + 512a^7c^5 + \\
&64a^8c^4 - 320b^2c^{10} + 64b^3c^9 + 576b^4c^8 - 192b^5c^7 - 448b \\
&^6c^6 + 192b^7c^5 + 128b^8c^4 - 64b^9c^3 - 1984a*b^2c^9 + 384a*b^ \\
&3c^8 + 2496a*b^4c^7 - 768a*b^5c^6 - 1088a*b^6c^5 + 384a*b^7c^4 + 6 \\
&4a*b^8c^3 - 5184a^2b^2c^8 + 960a^2b^3c^7 + 4224a^2b^4c^6 - 1152* \\
&a^2b^5c^5 - 832a^2b^6c^4 + 192a^2b^7c^3 - 7360a^3b^2c^7 + 1280a \\
&^3b^3c^6 + 3456a^3b^4c^5 - 768a^3b^5c^4 - 192a^3b^6c^3 - 6080a^ \\
&4b^2c^6 + 960a^4b^3c^5 + 1344a^4b^4c^4 - 192a^4b^5c^3 - 2880a^5 \\
&*b^2c^5 + 384a^5b^3c^4 + 192a^5b^4c^3 - 704a^6b^2c^4 + 64a^6b^3 \\
&*c^3 - 64a^7b^2c^3)) * (- (8a*c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4* \\
&c^4 + b^5 * (- (4a*c - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18 \\
&a*b^2c^5 + 24a*b^4c^3 + 3b*c^4 * (- (4a*c - b^2)^3)^{(1/2)} - 54a^2b^2c \\
&^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2 * (- (4a*c - b^2)^3)^{(1/2)} - \\
&10a*b^6c + 3a^2b*c^2 * (- (4a*c - b^2)^3)^{(1/2)} + 6a*b*c^3 * (- (4a*c - b \\
&^2)^3)^{(1/2)} - 4a*b^3c * (- (4a*c - b^2)^3)^{(1/2)}) / (2 * (3a^2b^8 - b^{10} - 3
\end{aligned}$$

$$\begin{aligned}
& a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c^5 + \\
& 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8 \\
& a^2b^2c^7 + 30a^2b^4c^5 - 36a^2b^6c^3 - 36a^3b^6c + 30a^5b^4c - 8 \\
& a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2 \\
& c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 \\
& - 96a^6b^2c^2 + 14a^2b^8c))^{(1/2)} * 2i + \operatorname{atan}(\frac{((-8a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5(-4ac - b^2)^3)^{(1/2)} - 2b^2c^6 \\
& + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 - 3b^2c^4(-4ac - \\
& b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2(-4ac - \\
& b^2)^3)^{(1/2)} - 10a^2b^6c - 3a^2b^2c^2(-4ac - b^2)^3)^{(1/2)} - 6a^2b^2c^3(-4ac - b^2)^3)^{(1/2)} + 4a^2b^3c(-4ac - b^2)^3)^{(1/2)}}{(2(3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + \\
& 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8a^2b^2c^7 + 30a^2b^4c^5 - 36a^2b^6c^3 - 36a^3b^6c + 30a^5b^4c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - \\
& 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14a^2b^8c))^{(1/2)} * (128a^2c^{13} - 64a^2b^{13} - 32b^{13}c + 32b^{14} - 96a^2b^{12} + 256a^3b^{11} + 64a^4b^{10} - 384a^5b^9 + 64a^6b^8 + 256a^7b^7 - 96a^8b^6 - 64a^9b^5 \\
& + 32a^{10}b^4 + 1408a^2c^{12} + 7040a^3c^{11} + 21120a^4c^{10} + 42240a^5c^9 + 59136a^6c^8 + 59136a^7c^7 + 42240a^8c^6 + 21120a^9c^5 + 7040a^{10}c^4 + 1408a^{11}c^3 + 128a^{12}c^2 - 32b^2c^{12} + 96b^3c^{11} + 64b^4c^{10} - 416b^5c^9 + 96b^6c^8 + 704b^7c^7 - 384b^8c^6 - 576b^9c^5 + 416b^{10}c^4 + 224b^{11}c^3 - 192b^{12}c^2 + \tan(x/2) * (-8a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5(-4ac - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^2b^2c^5 + 24a^2b^4c^3 - 3b^2c^4(-4ac - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2(-4ac - b^2)^3)^{(1/2)} - 10a^2b^6c - 3a^2b^2c^2(-4ac - b^2)^3)^{(1/2)} - 6a^2b^2c^3(-4ac - b^2)^3)^{(1/2)} + 4a^2b^3c(-4ac - b^2)^3)^{(1/2)}}{(2(3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8a^2b^2c^7 + 30a^2b^4c^5 - 36a^2b^6c^3 - 36a^3b^6c + 30a^5b^4c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14a^2b^8c))^{(1/2)} * (64a^2b^{14} - 256a^2c^{14} + 256a^{14}c - 64b^{14}c - 128a^2b^{13} - 256a^3b^{12} + 640a^4b^{11} + 320a^5b^{10} - 1280a^6b^9 + 1280a^8b^7 - 320a^9b^6 - 640a^{10}b^5 + 256a^{11}b^4 + 128a^{12}b^3 - 64a^{13}b^2 - 2816a^2c^{13} - 13824a^3c^{12} - 39424a^4c^{11} - 70400a^5c^{10} - 76032a^6c^9 - 33792a^7c^8 + 33792a^8c^7 + 76032a^9c^6 + 70400a^{10}c^5 + 39424a^{11}c^4 + 13824a^{12}c^3 + 2816a^{13}c^2 + 64b^2c^{13} - 128b^3c^{12} - 256b^4c^{11} + 640b^5c^{10} + 320b^6c^9 - 1280b^7c^8 + 1280b^9c^6 - 320b^{10}c^5 - 640b^{11}c^4 + 256b^{12}c^3 + 128b^{13}c^2 + 1728a^2b^2c^{12} - 3840a^2b^3c^{11} - 3584a^2b^4c^{10} + 10240a^2b^5c^9 + 2240a^2b^6c^8 - 12800a^2b^7c^7 + 1280a^2b^8c^6 + 7680a^2b^9c^5 - 1984a^2b^{10}c^4 - 1792a^2b^{11}c^3 + 512a^2b^{12}c^2 + 5120a^2b^2c^{12} - 512a^2b^2c^{12} + 22528a^3b^2c^{11} + 1792a^3b^2c^{11} + 56320a^4b^2c^{10} + 1984a^4b^2c^{10} + 84480a^5b^2c^9 - 7680a^5b^2c^9 + 67584a^6b^2c^8 - 1280a^6b^2c^8 + 12800a^7b^2c^7 - 67584a^8b^2c^6 - 2240a^8b^2c^6 - 84480a^9b^2c^5 - 10240a^9b^2c^5 - 56320a^{10}b^2c^4 + 3584a^{10}b^2c^4 - 22528a^{11}b^2c^3 + 3840a^{11}b^2c^3 - 5120a^{12}b^2c^2 - 1728a^{12}b^2c^2 + 12672a^2b^2c^{11} - 26112a^2b^3c^{10} - 17920a^2b^4c^9 + 48000a^2b^5c^8 + 6400a^2b^6c^7 - 38400a^2b^7c^6 + 3840a^2b^8c^5 + 11520a^2b^9c^4 - 1664a^2b^{10}c^3 + 45696a^3b^2c^{10} - 83200a^3b^3c^9 - 44800a^3b^4c^8 + 102400a^3b^5c^7 + 8960a^3b^6c^6 - 43520a^3b^7c^5 + 2560a^3b^8c^4 + 1664a^3b^{10}c^2 + 94400a^4b^2c^9 - 144000a^4b^3c^8 - 58880a^4b^4c^7 + 98560a^4b^5c^6 + 4480a^4b^6c^5 - 2560a^4b^8c^3 - 11520a^4b^9c^2 + 111168a^5b^2c^8 - 124416a^5b^3c^7 - 28672a^5b^4c^6 - 4480a^5b^6c^4 + 43520a^5b^7c^3 - 3840a^5b^8c^2 + 51456a^6b^2c^7 + 28672a^6b^4c^5 - 98560a^6b^5c^4}
\end{aligned}$$

$$\begin{aligned}
& c^4 - 8960a^6b^6c^3 + 38400a^6b^7c^2 - 51456a^7b^2c^6 + 124416a^7 \\
& *b^3c^5 + 58880a^7b^4c^4 - 102400a^7b^5c^3 - 6400a^7b^6c^2 - 1111 \\
& 68a^8b^2c^5 + 144000a^8b^3c^4 + 44800a^8b^4c^3 - 48000a^8b^5c^2 \\
& - 94400a^9b^2c^4 + 83200a^9b^3c^3 + 17920a^9b^4c^2 - 45696a^{10}b \\
& ^2c^3 + 26112a^{10}b^3c^2 - 12672a^{11}b^2c^2 + 512a*b*c^{13} - 512a^{13}b \\
& *c) - 608a*b^2c^{11} + 2624a*b^3c^{10} + 224a*b^4c^9 - 6208a*b^5c^8 + \\
& 2112a*b^6c^7 + 6784a*b^7c^6 - 3520a*b^8c^5 - 3584a*b^9c^4 + 2080a* \\
& b^{10}c^3 + 832a*b^{11}c^2 - 3840a^2b*c^{11} + 992a^2b^{11}c - 17280a^3b* \\
& c^{10} + 992a^3b^{10}c - 46080a^4b*c^9 - 3136a^4b^9c - 80640a^5b*c^8 \\
& - 320a^5b^8c - 96768a^6b*c^7 + 3776a^6b^7c - 80640a^7b*c^6 - 832* \\
& a^7b^6c - 46080a^8b*c^5 - 1952a^8b^5c - 17280a^9b*c^4 + 736a^9b^ \\
& 4c - 3840a^{10}b*c^3 + 352a^{10}b^3c - 384a^{11}b*c^2 - 160a^{11}b^2c - \\
& 4192a^2b^2c^{10} + 17888a^2b^3c^9 + 288a^2b^4c^8 - 30080a^2b^5c^7 \\
& + 8768a^2b^6c^6 + 22848a^2b^7c^5 - 8768a^2b^8c^4 - 7808a^2b^9c \\
& ^3 + 2592a^2b^{10}c^2 - 15648a^3b^2c^9 + 60160a^3b^3c^8 + 1152a^3b \\
& ^4c^7 - 73472a^3b^5c^6 + 15424a^3b^6c^5 + 37888a^3b^7c^4 - 8960a \\
& ^3b^8c^3 - 7552a^3b^9c^2 - 36672a^4b^2c^8 + 120512a^4b^3c^7 + 53 \\
& 76a^4b^4c^6 - 104384a^4b^5c^5 + 12800a^4b^6c^4 + 34112a^4b^7c^3 \\
& - 3712a^4b^8c^2 - 57792a^5b^2c^7 + 155008a^5b^3c^6 + 12096a^5b^ \\
& 4c^5 - 90496a^5b^5c^4 + 3776a^5b^6c^3 + 16512a^5b^7c^2 - 63168a^ \\
& 6b^2c^6 + 131264a^6b^3c^5 + 14784a^6b^4c^4 - 47488a^6b^5c^3 - 10 \\
& 88a^6b^6c^2 - 48192a^7b^2c^5 + 72448a^7b^3c^4 + 10368a^7b^4c^3 \\
& - 14080a^7b^5c^2 - 25248a^8b^2c^4 + 24800a^8b^3c^3 + 4032a^8b^4* \\
& c^2 - 8672a^9b^2c^3 + 4672a^9b^3c^2 - 1760a^{10}b^2c^2 - 384a*b*c^1 \\
& 2 - 416a*b^{12}c) + \tan(x/2)*(32a*b^{12} - 512a*c^{12} + 128b*c^{12} + 96b^{12} \\
& *c - 32b^{13} - 64c^{13} + 96a^2b^{11} - 96a^3b^{10} - 96a^4b^9 + 96a^5b^ \\
& 8 + 32a^6b^7 - 32a^7b^6 - 1728a^2c^{11} - 3072a^3c^{10} - 2688a^4c^9 \\
& + 2688a^6c^7 + 3072a^7c^6 + 1728a^8c^5 + 512a^9c^4 + 64a^{10}c^3 + \\
& 160b^2c^{11} - 544b^3c^{10} + 64b^4c^9 + 896b^5c^8 - 608b^6c^7 - 672* \\
& b^7c^6 + 800b^8c^5 + 160b^9c^4 - 448b^{10}c^3 + 64b^{11}c^2 + 480a*b^ \\
& 2c^{10} - 4352a*b^3c^9 + 2560a*b^4c^8 + 5248a*b^5c^7 - 5664a*b^6c^6 \\
& - 2240a*b^7c^5 + 4320a*b^8c^4 - 256a*b^9c^3 - 1216a*b^{10}c^2 + 5632* \\
& a^2b*c^{10} - 672a^2b^{10}c + 14336a^3b*c^9 - 768a^3b^9c + 23296a^4b \\
& *c^8 + 1248a^4b^8c + 25088a^5b*c^7 + 576a^5b^7c + 17920a^6b*c^6 - \\
& 864a^6b^6c + 8192a^7b*c^5 - 128a^7b^5c + 2176a^8b*c^4 + 192a^8* \\
& b^4c + 256a^9b*c^3 - 1408a^2b^2c^9 - 14720a^2b^3c^8 + 13440a^2b^ \\
& 4c^7 + 11904a^2b^5c^6 - 16800a^2b^6c^5 - 1696a^2b^7c^4 + 7168a^2 \\
& *b^8c^3 - 1216a^2b^9c^2 - 9856a^3b^2c^8 - 27392a^3b^3c^7 + 31232* \\
& a^3b^4c^6 + 12928a^3b^5c^5 - 23264a^3b^6c^4 + 1152a^3b^7c^3 + 48 \\
& 00a^3b^8c^2 - 22848a^4b^2c^7 - 30400a^4b^3c^6 + 39680a^4b^4c^5 \\
& + 6272a^4b^5c^4 - 16544a^4b^6c^3 + 1824a^4b^7c^2 - 29120a^5b^2c^ \\
& ^6 - 20224a^5b^3c^5 + 29184a^5b^4c^4 + 384a^5b^5c^3 - 5856a^5b^6 \\
& *c^2 - 22400a^6b^2c^5 - 7552a^6b^3c^4 + 12160a^6b^4c^3 - 640a^6b^ \\
& ^5c^2 - 10368a^7b^2c^4 - 1280a^7b^3c^3 + 2560a^7b^4c^2 - 2656a^8 \\
& *b^2c^3 - 32a^8b^3c^2 - 288a^9b^2c^2 + 1280a*b*c^{11} + 320a*b^{11}c) \\
& )*(-(8a*c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5*(-(4a*c - b \\
& ^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a*b^2c^5 + 24a*b^4 \\
& c^3 - 3b*c^4*(-(4a*c - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - \\
& 38a^3b^2c^3 + 3b^3c^2*(-(4a*c - b^2)^3)^{(1/2)} - 10a*b^6c - 3a^2b* \\
& c^2*(-(4a*c - b^2)^3)^{(1/2)} - 6a*b*c^3*(-(4a*c - b^2)^3)^{(1/2)} + 4a*b^3 \\
& *c*(-(4a*c - b^2)^3)^{(1/2)})/(2*(3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 1 \\
& 6a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c \\
& ^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8a*b^2c^7 + 30a*b^4* \\
& c^5 - 36a*b^6c^3 - 36a^3b^6c + 30a^5b^4c - 8a^7b^2c - 96a^2b^2 \\
& *c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 \\
& - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 1 \\
& 4a*b^8c)))^{(1/2)}*1i - (((-8a*c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4 \\
& *c^4 - b^5*(-(4a*c - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 1 \\
& 8a*b^2c^5 + 24a*b^4c^3 - 3b*c^4*(-(4a*c - b^2)^3)^{(1/2)} - 54a^2b^2c^
\end{aligned}$$

$$\begin{aligned}
& c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2(-4ac - b^2)^3)^{(1/2)} \\
& - 10ab^6c - 3a^2b^2c^2(-4ac - b^2)^3)^{(1/2)} - 6ab^3c^3(-4ac - \\
& b^2)^3)^{(1/2)} + 4ab^3c^3(-4ac - b^2)^3)^{(1/2)} / (2(3a^2b^8 - b^{10} - \\
& 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c^5 + \\
& 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - \\
& 8ab^2c^7 + 30ab^4c^5 - 36ab^6c^3 - 36a^3b^6c + 30a^5b^4c - 8 \\
& a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^ \\
& 2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c \\
& ^3 - 96a^6b^2c^2 + 14ab^8c))^{(1/2)} * (128a^c^{13} - 64ab^{13} - 32b^{13} \\
& *c + 32b^{14} - 96a^2b^{12} + 256a^3b^{11} + 64a^4b^{10} - 384a^5b^9 + 64a \\
& a^6b^8 + 256a^7b^7 - 96a^8b^6 - 64a^9b^5 + 32a^{10}b^4 + 1408a^2c^ \\
& 12 + 7040a^3c^{11} + 21120a^4c^{10} + 42240a^5c^9 + 59136a^6c^8 + 59136 \\
& *a^7c^7 + 42240a^8c^6 + 21120a^9c^5 + 7040a^{10}c^4 + 1408a^{11}c^3 + \\
& 128a^{12}c^2 - 32b^2c^{12} + 96b^3c^{11} + 64b^4c^{10} - 416b^5c^9 + 96b \\
& ^6c^8 + 704b^7c^7 - 384b^8c^6 - 576b^9c^5 + 416b^{10}c^4 + 224b^{11}c \\
& ^3 - 192b^{12}c^2 - \tan(x/2) * (-8a^c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + \\
& 8a^4c^4 - b^5(-4ac - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^ \\
& 2 - 18ab^2c^5 + 24ab^4c^3 - 3b^2c^4(-4ac - b^2)^3)^{(1/2)} - 54a^2 \\
& *b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2(-4ac - b^2)^3)^{(1/2)} \\
& - 10ab^6c - 3a^2b^2c^2(-4ac - b^2)^3)^{(1/2)} - 6ab^3c^3(-4ac \\
& - b^2)^3)^{(1/2)} + 4ab^3c^3(-4ac - b^2)^3)^{(1/2)} / (2(3a^2b^8 - b^ \\
& 10 - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c \\
& ^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c \\
& ^2 - 8ab^2c^7 + 30ab^4c^5 - 36ab^6c^3 - 36a^3b^6c + 30a^5b^4c \\
& c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a \\
& ^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b \\
& ^2c^3 - 96a^6b^2c^2 + 14ab^8c))^{(1/2)} * (64ab^{14} - 256a^c^{14} + 25 \\
& 6a^{14}c - 64b^{14}c - 128a^2b^{13} - 256a^3b^{12} + 640a^4b^{11} + 320a^5 \\
& *b^{10} - 1280a^6b^9 + 1280a^8b^7 - 320a^9b^6 - 640a^{10}b^5 + 256a^{11} \\
& *b^4 + 128a^{12}b^3 - 64a^{13}b^2 - 2816a^2c^{13} - 13824a^3c^{12} - 39424a \\
& a^4c^{11} - 70400a^5c^{10} - 76032a^6c^9 - 33792a^7c^8 + 33792a^8c^7 + \\
& 76032a^9c^6 + 70400a^{10}c^5 + 39424a^{11}c^4 + 13824a^{12}c^3 + 2816a^ \\
& 13c^2 + 64b^2c^{13} - 128b^3c^{12} - 256b^4c^{11} + 640b^5c^{10} + 320b^6 \\
& *c^9 - 1280b^7c^8 + 1280b^9c^6 - 320b^{10}c^5 - 640b^{11}c^4 + 256b^{12} \\
& *c^3 + 128b^{13}c^2 + 1728ab^2c^{12} - 3840ab^3c^{11} - 3584ab^4c^{10} + \\
& 10240ab^5c^9 + 2240ab^6c^8 - 12800ab^7c^7 + 1280ab^8c^6 + 7680 \\
& *ab^9c^5 - 1984ab^{10}c^4 - 1792ab^{11}c^3 + 512ab^{12}c^2 + 5120a^2b \\
& *c^{12} - 512a^2b^{12}c + 22528a^3b^2c^{11} + 1792a^3b^{11}c + 56320a^4b^ \\
& c^{10} + 1984a^4b^{10}c + 84480a^5b^2c^9 - 7680a^5b^9c + 67584a^6b^2c^8 \\
& - 1280a^6b^8c + 12800a^7b^7c - 67584a^8b^2c^6 - 2240a^8b^6c - 84 \\
& 480a^9b^2c^5 - 10240a^9b^5c - 56320a^{10}b^2c^4 + 3584a^{10}b^4c - 2252 \\
& 8a^{11}b^2c^3 + 3840a^{11}b^3c - 5120a^{12}b^2c^2 - 1728a^{12}b^2c + 12672a \\
& ^2b^2c^{11} - 26112a^2b^3c^{10} - 17920a^2b^4c^9 + 48000a^2b^5c^8 + \\
& 6400a^2b^6c^7 - 38400a^2b^7c^6 + 3840a^2b^8c^5 + 11520a^2b^9c^ \\
& 4 - 1664a^2b^{10}c^3 + 45696a^3b^2c^{10} - 83200a^3b^3c^9 - 44800a^3b \\
& ^4c^8 + 102400a^3b^5c^7 + 8960a^3b^6c^6 - 43520a^3b^7c^5 + 2560a \\
& ^3b^8c^4 + 1664a^3b^{10}c^2 + 94400a^4b^2c^9 - 144000a^4b^3c^8 - \\
& 58880a^4b^4c^7 + 98560a^4b^5c^6 + 4480a^4b^6c^5 - 2560a^4b^8c^3 \\
& - 11520a^4b^9c^2 + 111168a^5b^2c^8 - 124416a^5b^3c^7 - 28672a^5b \\
& ^4c^6 - 4480a^5b^6c^4 + 43520a^5b^7c^3 - 3840a^5b^8c^2 + 51456a \\
& ^6b^2c^7 + 28672a^6b^4c^5 - 98560a^6b^5c^4 - 8960a^6b^6c^3 + 384 \\
& 00a^6b^7c^2 - 51456a^7b^2c^6 + 124416a^7b^3c^5 + 58880a^7b^4c^4 \\
& - 102400a^7b^5c^3 - 6400a^7b^6c^2 - 111168a^8b^2c^5 + 144000a^8b \\
& ^3c^4 + 44800a^8b^4c^3 - 48000a^8b^5c^2 - 94400a^9b^2c^4 + 83200 \\
& *a^9b^3c^3 + 17920a^9b^4c^2 - 45696a^{10}b^2c^3 + 26112a^{10}b^3c^2 \\
& - 12672a^{11}b^2c^2 + 512ab^2c^{13} - 512a^{13}b^2c) - 608ab^2c^{11} + 2624 \\
& *ab^3c^{10} + 224ab^4c^9 - 6208ab^5c^8 + 2112ab^6c^7 + 6784ab^7c \\
& ^6 - 3520ab^8c^5 - 3584ab^9c^4 + 2080ab^{10}c^3 + 832ab^{11}c^2 - \\
& 3840a^2b^2c^{11} + 992a^2b^{11}c - 17280a^3b^2c^{10} + 992a^3b^{10}c - 4608
\end{aligned}$$

$$\begin{aligned}
& 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 - \\
& 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)}*i)/(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 -
\end{aligned}$$

$$\begin{aligned}
& (96a^6b^2c^2 + 14a^8b^8c))^{1/2} \cdot (128a^3c^{13} - 64a^4b^{13} - 32b^{13}c + \\
& 32b^{14} - 96a^2b^{12} + 256a^3b^{11} + 64a^4b^{10} - 384a^5b^9 + 64a^6b^8 + 256a^7b^7 - 96a^8b^6 - 64a^9b^5 + 32a^{10}b^4 + 1408a^2c^{12} + \\
& 7040a^3c^{11} + 21120a^4c^{10} + 42240a^5c^9 + 59136a^6c^8 + 59136a^7c^7 + 42240a^8c^6 + 21120a^9c^5 + 7040a^{10}c^4 + 1408a^{11}c^3 + 128a^{12}c^2 - 32b^2c^{12} + 96b^3c^{11} + 64b^4c^{10} - 416b^5c^9 + 96b^6c^8 + 704b^7c^7 - 384b^8c^6 - 576b^9c^5 + 416b^{10}c^4 + 224b^{11}c^3 - \\
& 192b^{12}c^2 + \tan(x/2) \cdot (-(8a^3c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 \cdot (-(4a^3c - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 1 \\
& 8a^2b^2c^5 + 24a^2b^4c^3 - 3b^3c^4 \cdot (-(4a^3c - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 \cdot (-(4a^3c - b^2)^3)^{1/2} \\
& - 10a^2b^6c - 3a^2b^3c^2 \cdot (-(4a^3c - b^2)^3)^{1/2} - 6a^2b^3c^3 \cdot (-(4a^3c - b^2)^3)^{1/2} + 4a^2b^3c^4 \cdot (-(4a^3c - b^2)^3)^{1/2}) / (2 \cdot (3a^2b^8 - b^{10} - \\
& 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - \\
& 8a^2b^2c^7 + 30a^2b^4c^5 - 36a^2b^6c^3 - 36a^3b^6c + 30a^5b^4c - 8 \\
& a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14a^8b^8c))^{1/2} \cdot (64a^4b^{14} - 256a^3c^{14} + 256a^{14}c - 64b^{14}c - 128a^2b^{13} - 256a^3b^{12} + 640a^4b^{11} + 320a^5b^{10} - 1280a^6b^9 + 1280a^8b^7 - 320a^9b^6 - 640a^{10}b^5 + 256a^{11}b^4 + 128a^{12}b^3 - 64a^{13}b^2 - 2816a^2c^{13} - 13824a^3c^{12} - 39424a^4c^{11} - 70400a^5c^{10} - 76032a^6c^9 - 33792a^7c^8 + 33792a^8c^7 + 76032a^9c^6 + 70400a^{10}c^5 + 39424a^{11}c^4 + 13824a^{12}c^3 + 2816a^{13}c^2 + 64b^2c^{13} - 128b^3c^{12} - 256b^4c^{11} + 640b^5c^{10} + 320b^6c^9 - 1280b^7c^8 + 1280b^9c^6 - 320b^{10}c^5 - 640b^{11}c^4 + 256b^{12}c^3 + 128b^{13}c^2 + 1728a^2b^2c^{12} - 3840a^2b^3c^{11} - 3584a^2b^4c^{10} + 10240a^2b^5c^9 + 2240a^2b^6c^8 - 12800a^2b^7c^7 + 1280a^2b^8c^6 + 7680a^2b^9c^5 - 1984a^2b^{10}c^4 - 1792a^2b^{11}c^3 + 512a^2b^{12}c^2 + 5120a^2b^2c^{12} - 512a^2b^{12}c + 22528a^3b^3c^{11} + 1792a^3b^{11}c + 56320a^4b^3c^{10} + 1984a^4b^{10}c + 84480a^5b^3c^9 - 7680a^5b^9c + 67584a^6b^3c^8 - 1280a^6b^8c + 12800a^7b^7c - 67584a^8b^3c^6 - 2240a^8b^6c - 84480a^9b^3c^5 - 10240a^9b^5c - 56320a^{10}b^3c^4 + 3584a^{10}b^4c - 22528a^{11}b^3c^3 + 3840a^{11}b^3c - 5120a^{12}b^3c^2 - 1728a^{12}b^2c + 12672a^2b^2c^{11} - 26112a^2b^3c^{10} - 17920a^2b^4c^9 + 48000a^2b^5c^8 + 6400a^2b^6c^7 - 38400a^2b^7c^6 + 3840a^2b^8c^5 + 11520a^2b^9c^4 - 1664a^2b^{10}c^3 + 45696a^3b^2c^{10} - 83200a^3b^3c^9 - 44800a^3b^4c^8 + 102400a^3b^5c^7 + 8960a^3b^6c^6 - 43520a^3b^7c^5 + 2560a^3b^8c^4 + 1664a^3b^{10}c^2 + 94400a^4b^2c^9 - 144000a^4b^3c^8 - 58880a^4b^4c^7 + 98560a^4b^5c^6 + 4480a^4b^6c^5 - 2560a^4b^8c^3 - 11520a^4b^9c^2 + 111168a^5b^2c^8 - 124416a^5b^3c^7 - 28672a^5b^4c^6 - 4480a^5b^6c^4 + 43520a^5b^7c^3 - 3840a^5b^8c^2 + 51456a^6b^2c^7 + 28672a^6b^4c^5 - 98560a^6b^5c^4 - 8960a^6b^6c^3 + 38400a^6b^7c^2 - 51456a^7b^2c^6 + 124416a^7b^3c^5 + 58880a^7b^4c^4 - 102400a^7b^5c^3 - 6400a^7b^6c^2 - 111168a^8b^2c^5 + 144000a^8b^3c^4 + 44800a^8b^4c^3 - 48000a^8b^5c^2 - 94400a^9b^2c^4 + 83200a^9b^3c^3 + 17920a^9b^4c^2 - 45696a^{10}b^2c^3 + 26112a^{10}b^3c^2 - 12672a^{11}b^2c^2 + 512a^2b^2c^{13} - 512a^{13}b^2c) - 608a^2b^2c^{11} + 2624a^2b^3c^{10} + 224a^2b^4c^9 - 6208a^2b^5c^8 + 2112a^2b^6c^7 + 6784a^2b^7c^6 - 3520a^2b^8c^5 - 3584a^2b^9c^4 + 2080a^2b^{10}c^3 + 832a^2b^{11}c^2 - 3840a^2b^2c^{11} + 992a^2b^{11}c - 17280a^3b^3c^{10} + 992a^3b^{10}c - 46080a^4b^3c^9 - 3136a^4b^9c - 80640a^5b^3c^8 - 320a^5b^8c - 96768a^6b^3c^7 + 3776a^6b^7c - 80640a^7b^3c^6 - 832a^7b^6c - 46080a^8b^3c^5 - 1952a^8b^5c - 17280a^9b^3c^4 + 736a^9b^4c - 3840a^{10}b^3c^3 + 352a^{10}b^3c - 384a^{11}b^3c^2 - 160a^{11}b^2c - 4192a^2b^2c^{10} + 17888a^2b^3c^9 + 288a^2b^4c^8 - 30080a^2b^5c^7 + 8768a^2b^6c^6 + 22848a^2b^7c^5 - 8768a^2b^8c^4 - 7808a^2b^9c^3 + 2592a^2b^{10}c^2 - 15648a^3b^2c^9 + 60160a^3b^3c^8 + 1152a^3b^4c^7 - 73472a^3b^5c^6 + 15424a^3b^6c^5 + 37888a^3b^7c^4 - 8960a^3b^8c^3 - 7552a^3b^9c^2 - 3
\end{aligned}$$



$$\begin{aligned}
& 6672a^4b^2c^8 + 120512a^4b^3c^7 + 5376a^4b^4c^6 - 104384a^4b^5c^5 + 12800a^4b^6c^4 + 34112a^4b^7c^3 - 3712a^4b^8c^2 - 57792a^5b^2c^7 + 155008a^5b^3c^6 + 12096a^5b^4c^5 - 90496a^5b^5c^4 + 3776a^5b^6c^3 + 16512a^5b^7c^2 - 63168a^6b^2c^6 + 131264a^6b^3c^5 + 14784a^6b^4c^4 - 47488a^6b^5c^3 - 1088a^6b^6c^2 - 48192a^7b^2c^5 + 72448a^7b^3c^4 + 10368a^7b^4c^3 - 14080a^7b^5c^2 - 25248a^8b^2c^4 + 24800a^8b^3c^3 + 4032a^8b^4c^2 - 8672a^9b^2c^3 + 4672a^9b^3c^2 - 1760a^{10}b^2c^2 - 384a^*b^*c^{12} - 416a^*b^{12}c) + \tan(x/2) * (32a^*b^{12} - 512a^*c^{12} + 128b^*c^{12} + 96b^{12}c - 32b^{13} - 64c^{13} + 96a^2b^{11} - 96a^3b^{10} - 96a^4b^9 + 96a^5b^8 + 32a^6b^7 - 32a^7b^6 - 1728a^2c^{11} - 3072a^3c^{10} - 2688a^4c^9 + 2688a^6c^7 + 3072a^7c^6 + 1728a^8c^5 + 512a^9c^4 + 64a^{10}c^3 + 160b^2c^{11} - 544b^3c^{10} + 64b^4c^9 + 896b^5c^8 - 608b^6c^7 - 672b^7c^6 + 800b^8c^5 + 160b^9c^4 - 448b^{10}c^3 + 64b^{11}c^2 + 480a^*b^2c^{10} - 4352a^*b^3c^9 + 2560a^*b^4c^8 + 5248a^*b^5c^7 - 5664a^*b^6c^6 - 2240a^*b^7c^5 + 4320a^*b^8c^4 - 256a^*b^9c^3 - 1216a^*b^{10}c^2 + 5632a^2b^*c^{10} - 672a^2b^{10}c + 14336a^3b^*c^9 - 768a^3b^9c + 23296a^4b^*c^8 + 1248a^4b^8c + 25088a^5b^*c^7 + 576a^5b^7c + 17920a^6b^*c^6 - 864a^6b^6c + 8192a^7b^*c^5 - 128a^7b^5c + 2176a^8b^*c^4 + 192a^8b^4c + 256a^9b^*c^3 - 1408a^2b^2c^9 - 14720a^2b^3c^8 + 13440a^2b^4c^7 + 11904a^2b^5c^6 - 16800a^2b^6c^5 - 1696a^2b^7c^4 + 7168a^2b^8c^3 - 1216a^2b^9c^2 - 9856a^3b^2c^8 - 27392a^3b^3c^7 + 31232a^3b^4c^6 + 12928a^3b^5c^5 - 23264a^3b^6c^4 + 1152a^3b^7c^3 + 4800a^3b^8c^2 - 22848a^4b^2c^7 - 30400a^4b^3c^6 + 39680a^4b^4c^5 + 6272a^4b^5c^4 - 16544a^4b^6c^3 + 1824a^4b^7c^2 - 29120a^5b^2c^6 - 20224a^5b^3c^5 + 29184a^5b^4c^4 + 384a^5b^5c^3 - 5856a^5b^6c^2 - 22400a^6b^2c^5 - 7552a^6b^3c^4 + 12160a^6b^4c^3 - 640a^6b^5c^2 - 10368a^7b^2c^4 - 1280a^7b^3c^3 + 2560a^7b^4c^2 - 2656a^8b^2c^3 - 32a^8b^3c^2 - 288a^9b^2c^2 + 1280a^*b^*c^{11} + 320a^*b^{11}c) * (- (8a^*c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- (4a^*c - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^*b^2c^5 + 24a^*b^4c^3 - 3b^*c^4 * (- (4a^*c - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (- (4a^*c - b^2)^3)^{1/2} - 10a^*b^6c - 3a^2b^*c^2 * (- (4a^*c - b^2)^3)^{1/2} - 6a^*b^*c^3 * (- (4a^*c - b^2)^3)^{1/2} + 4a^*b^3c * (- (4a^*c - b^2)^3)^{1/2}) / (2 * (3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8a^*b^2c^7 + 30a^*b^4c^5 - 36a^*b^6c^3 - 36a^3b^6c + 30a^5b^4c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14a^*b^8c))^{1/2} + ((- (8a^*c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- (4a^*c - b^2)^3)^{1/2} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18a^*b^2c^5 + 24a^*b^4c^3 - 3b^*c^4 * (- (4a^*c - b^2)^3)^{1/2} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (- (4a^*c - b^2)^3)^{1/2} - 10a^*b^6c - 3a^2b^*c^2 * (- (4a^*c - b^2)^3)^{1/2} - 6a^*b^*c^3 * (- (4a^*c - b^2)^3)^{1/2} + 4a^*b^3c * (- (4a^*c - b^2)^3)^{1/2}) / (2 * (3a^2b^8 - b^{10} - 3a^4b^6 + a^6b^4 + 16a^2c^8 + 96a^3c^7 + 240a^4c^6 + 320a^5c^5 + 240a^6c^4 + 96a^7c^3 + 16a^8c^2 + b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8a^*b^2c^7 + 30a^*b^4c^5 - 36a^*b^6c^3 - 36a^3b^6c + 30a^5b^4c - 8a^7b^2c - 96a^2b^2c^6 + 159a^2b^4c^4 - 82a^2b^6c^2 - 312a^3b^2c^5 + 260a^3b^4c^3 - 448a^4b^2c^4 + 159a^4b^4c^2 - 312a^5b^2c^3 - 96a^6b^2c^2 + 14a^*b^8c))^{1/2} * (128a^*c^{13} - 64a^*b^{13} - 32b^{13}c + 32b^{14} - 96a^2b^{12} + 256a^3b^{11} + 64a^4b^{10} - 384a^5b^9 + 64a^6b^8 + 256a^7b^7 - 96a^8b^6 - 64a^9b^5 + 32a^{10}b^4 + 1408a^2c^{12} + 7040a^3c^{11} + 21120a^4c^{10} + 42240a^5c^9 + 59136a^6c^8 + 59136a^7c^7 + 42240a^8c^6 + 21120a^9c^5 + 7040a^{10}c^4 + 1408a^{11}c^3 + 128a^{12}c^2 - 32b^2c^{12} + 96b^3c^{11} + 64b^4c^{10} - 416b^5c^9 + 96b^6c^8 + 704b^7c^7 - 384b^8c^6 - 576b^9c^5 + 416b^{10}c^4 + 224b^{11}c^3 - 192b^{12}c^2 - \tan(x/2) * (- (8a^*c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- (4a^*c - b^2)^3)^{1/2}
\end{aligned}$$

$$\begin{aligned}
& 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 \\
& 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
\end{aligned}$$

$$\begin{aligned}
& 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))
\end{aligned}$$

**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)
```

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

**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\_))^(n\_), x\_Symbol] :> Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

**Rule 616**

Int[((a\_.) + (b\_.)\*(x\_) + (c\_.)\*(x\_)^2)^(n\_), 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] - 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] && IntegerQ[(m - 1)/2]

**Rubi steps**

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

**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

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

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

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

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

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

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

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

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

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

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

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

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

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

**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\_))^(n\_), x\_Symbol] :> Simp[Log[RemoveContent[a + b\*x, x]]/b, x] /; FreeQ[{a, b}, x]

#### Rule 616

Int[((a\_.) + (b\_.)\*(x\_) + (c\_.)\*(x\_)^2)^(n\_), 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] - 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] && IntegerQ[(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

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

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

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

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

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

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

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

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

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

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

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

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



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

**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[Int[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] && IntegerQ[(m - 1)/2]

#### Rubi steps

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

**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

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

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

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

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

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

Optimal. Leaf size=36

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

[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}

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

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] /; FreeQ[{a, b, c}, x] && NeQ[b^2 - 4\*a\*c, 0] && LtQ[p, -1] && NeQ[p, -3/2] && IntegerQ[4\*p]

#### Rule 618

Int[((a\_.) + (b\_.)\*(x\_) + (c\_.)\*(x\_)^2)^(-1), x\_Symbol] :> Dist[-2, Subst[Int[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, 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] && IntegerQ[(m - 1)/2]

#### Rubi steps

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

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

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

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

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

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

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

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

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

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

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

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]  $-\operatorname{atan}(\cos(x)/3 - 2/3)/54 - (\cos(x)/18 - 1/9)/(\cos(x)^2 - 4*\cos(x) + 13)$

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $-\cos(x)**2*\operatorname{atan}(\cos(x)/3 - 2/3)/(54*\cos(x)**2 - 216*\cos(x) + 702) + 4*\cos(x)*\operatorname{atan}(\cos(x)/3 - 2/3)/(54*\cos(x)**2 - 216*\cos(x) + 702) - 3*\cos(x)/(54*\cos(x)**2 - 216*\cos(x) + 702) - 13*\operatorname{atan}(\cos(x)/3 - 2/3)/(54*\cos(x)**2 - 216*\cos(x) + 702) + 6/(54*\cos(x)**2 - 216*\cos(x) + 702)$

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

**Optimal.** Leaf size=326

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

[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}

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

Antiderivative was successfully verified.

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

[Out]  $x/(2*c) + ((b^2 - a*c)*x)/c^3 - (2*(b^3 - 2*a*b*c - (b^4 - 4*a*b^2*c + 2*a^2*c^2)/\text{Sqrt}[b^2 - 4*a*c])*\text{ArcTan}[(\text{Sqrt}[b - 2*c - \text{Sqrt}[b^2 - 4*a*c]])*\text{Tan}[x/2])/\text{Sqrt}[b + 2*c - \text{Sqrt}[b^2 - 4*a*c]])/(c^3*\text{Sqrt}[b - 2*c - \text{Sqrt}[b^2 - 4*a*c]])*\text{Sqrt}[b + 2*c - \text{Sqrt}[b^2 - 4*a*c]]) - (2*(b^3 - 2*a*b*c + (b^4 - 4*a*b^2*c + 2*a^2*c^2)/\text{Sqrt}[b^2 - 4*a*c])*\text{ArcTan}[(\text{Sqrt}[b - 2*c + \text{Sqrt}[b^2 - 4*a*c]])*\text{Tan}[x/2])/\text{Sqrt}[b + 2*c + \text{Sqrt}[b^2 - 4*a*c]])/(c^3*\text{Sqrt}[b - 2*c + \text{Sqrt}[b^2 - 4*a*c]])*\text{Sqrt}[b + 2*c + \text{Sqrt}[b^2 - 4*a*c]]) - (b*\sin[x])/c^2 + (\cos[x]*\sin[x])/(2*c)$

#### 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*Ssin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Ssin[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] /
; 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

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

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

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

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

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

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

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

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])
```



$$\frac{2 - 4ac}{\sqrt{-2b^2 + 4c(a+c) - 2b\sqrt{b^2 - 4ac}}}}{\sqrt{b^2 - 4ac}\sqrt{-b^2 + 2c(a+c) - b\sqrt{b^2 - 4ac}}} - \frac{4\sqrt{2}(-b^4 + 4ab^2c - 2a^2c^2 + b^3\sqrt{b^2 - 4ac} - 2ab^2c\sqrt{b^2 - 4ac})\operatorname{ArcTanh}\left(\frac{(-b + 2c + \sqrt{b^2 - 4ac})\tan(x/2)}{\sqrt{-2b^2 + 4c(a+c) + 2b\sqrt{b^2 - 4ac}}}\right)}{\sqrt{b^2 - 4ac}\sqrt{-b^2 + 2c(a+c) + b\sqrt{b^2 - 4ac}}} - \frac{4b^2c\sin x + c^2\sin 2x}{4c^3}$$

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

$$\begin{aligned}
& + 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
\end{aligned}$$

$$\begin{aligned}
&^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)*\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 \\
&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 \\
&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 \\
&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
\end{aligned}$$

$*b^6)*c)*\cos(x)) + 2*(2*b^2 - 2*a*c + c^2)*x + 2*(c^2*\cos(x) - 2*b*c)*\sin(x)))/c^3$

**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] 
$$\begin{aligned} & -2/c/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)} \\ & *\operatorname{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)} \\ & *\operatorname{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)}*\operatorname{ar} \\ & \operatorname{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)} \\ & *\operatorname{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)} \\ & *\operatorname{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)} \\ & *\operatorname{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)}*\operatorname{ar} \\ & \operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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/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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)} \\ & *\operatorname{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)}*\operatorname{arctan}((a-b+c) \end{aligned}$$

$$\begin{aligned} & * \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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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 / (a-b+c) / (((-4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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^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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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^3*a / (a-b+c) / (((-4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)} * \operatorname{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)} * \operatorname{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 * \operatorname{arctan}(\tan(1/2*x)) * a+2/c^3 * \operatorname{arctan}(\tan(1/2*x)) * b^2 \end{aligned}$$

**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]  $\frac{1}{4} * (4*c^3 * \operatorname{integrate}(-2*(2*(b^4 - 2*a*b^2*c)*\cos(3*x))^2 + 4*(2*a^2*b^2 - a^2*c^2 - (2*a^3 - a*b^2)*c)*\cos(2*x))^2 + 2*(b^4 - 2*a*b^2*c)*\cos(x))^2 + 2*(b^4 - 2*a*b^2*c)*\sin(3*x))^2 + 4*(2*a^2*b^2 - a^2*c^2 - (2*a^3 - a*b^2)*c)*\sin(2*x))^2 + 2*(4*a*b^3 - 2*a*b*c^2 - (6*a^2*b - b^3)*c)*\sin(2*x)*\sin(x) + 2*(b^4 - 2*a*b^2*c)*\sin(x))^2 + ((b^3*c - 2*a*b*c^2)*\cos(3*x) + 2*(a*b^2*c - a^2*c^2)*\cos(2*x) + (b^3*c - 2*a*b*c^2)*\cos(x))*\cos(4*x) + (b^3*c - 2*a*b*c^2 + 2*(4*a*b^3 - 2*a*b*c^2 - (6*a^2*b - b^3)*c)*\cos(2*x) + 4*(b^4 - 2*a*b^2*c)*\cos(x))*\cos(3*x) + 2*(a*b^2*c - a^2*c^2 + (4*a*b^3 - 2*a*b*c^2 - (6*a^2*b - b^3)*c)*\cos(x))*\cos(2*x) + (b^3*c - 2*a*b*c^2)*\cos(x) + ((b^3*c - 2*a*b*c^2)*\sin(3*x) + 2*(a*b^2*c - a^2*c^2)*\sin(2*x) + (b^3*c - 2*a*b*c^2)*\sin(x))*\sin(4*x) + 2*((4*a*b^3 - 2*a*b*c^2 - (6*a^2*b - b^3)*c)*\sin(2*x) + 2*(b^4 - 2*a*b^2*c)*\sin(x))*\sin(3*x)) / (c^5*\cos(4*x))^2 + 4*b^2*c^3*\cos(3*x))^2 + 4*b^2*c^3*\cos(x))^2 + c^5*\sin(4*x))^2 + 4*b^2*c^3*\sin(3*x))^2 + 4*b^2*c^3*\sin(x))^2 + 4*b*c^4*\cos(x) + c^5 + 4*(4*a^2*c^3 + 4*a*c^4 + c^5)*\cos(2*x))^2 + 4*$

$$(4a^2c^3 + 4ac^4 + c^5)\sin(2x)^2 + 8(2ab^3c + b^4c)\sin(2x)\sin(x) + 2(2b^4c\cos(3x) + 2b^4c\cos(x) + c^5 + 2(2ac^4 + c^5)\cos(2x))\cos(4x) + 4(2b^2c^3\cos(x) + b^4c + 2(2ab^3c + b^4c)\cos(2x))\cos(3x) + 4(2ac^4 + c^5 + 2(2ab^3c + b^4c)\cos(x))\cos(2x) + 4(b^4c\sin(3x) + b^4c\sin(x) + (2ac^4 + c^5)\sin(2x))\sin(4x) + 8(b^2c^3\sin(x) + (2ab^3c + b^4c)\sin(2x))\sin(3x), x + c^2\sin(2x) - 4b^2c\sin(x) + 2(2b^2 - 2ac + c^2)x/c^3$$

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]  $\text{int}(\cos(x)^4/(a + b\cos(x) + c\cos(x)^2), x)$

[Out]  $\text{atan}(\frac{((2048(12a^3c^{11} - 28a^4c^{10} - 44a^5c^9 + 72a^6c^8 + 88a^7c^7 + 12a^8c^6 + b^5c^9 - 4b^6c^8 + 10b^7c^7 - 20b^8c^6 + 29b^9c^5 - 30b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 6ab^3c^{10} + 27ab^4c^9 - 72ab^5c^8 + 154ab^6c^7 - 238ab^7c^6 + 251ab^8c^5 - 228ab^9c^4 + 98ab^{10}c^3 + 20ab^{11}c^2 + 8a^2b^3c^{11} - 68a^3b^4c^{10} + 112a^4b^5c^9 + 100a^5b^6c^8 - 200a^6b^7c^7 - 96a^7b^8c^6 - 47a^2b^2c^{10} + 145a^2b^3c^9 - 354a^2b^4c^8 + 612a^2b^5c^7 - 655a^2b^6c^6 + 635a^2b^7c^5 - 202a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 + 239a^3b^2c^9 - 524a^3b^3c^8 + 536a^3b^4c^7 - 564a^3b^5c^6 - 115a^3b^6c^5 + 856a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9c^2 - 37a^4b^2c^8 + 9a^4b^3c^7 + 583a^4b^4c^6 - 1362a^4b^5c^5 - 152a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 399a^5b^2c^7 + 904a^5b^3c^6 + 394a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 340a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 100a^7b^2c^5))}{c^8} + \frac{((2048(16a^3c^{13} - 32a^2c^{14} + 176a^4c^{12} + 176a^5c^{11} + 48a^6c^{10} - 2b^4c^{12} + 6b^5c^{11} - 18b^6c^{10} + 26b^7c^9 - 12b^8c^8 + 16ab^2c^{13} - 40ab^3c^{12} + 122ab^4c^{11} - 192ab^5c^{10} + 74ab^6c^9 + 20ab^7c^8 + 64a^2b^3c^{13} - 144a^3b^4c^{12} - 352a^4b^5c^{11} - 144a^5b^6c^{10} - 204a^2b^2c^{12} + 388a^2b^3c^{11} - 50a^2b^4c^{10} - 182a^2b^5c^9 + 4a^2b^6c^8 - 260a^3b^2c^{11} + 496a^3b^3c^{10} + 10a^3b^4c^9 - 20a^3b^5c^8 - 148a^4b^2c^{10} + 116a^4b^3c^9 + 8a^4b^4c^8 - 44a^5b^2c^9))}{c^8} - (2048\tan(x/2)*(-(a^2b^8 - b^{10} + 8a^5c^5 + 8a^6c^4 - b^7*(-(4ac - b^2)^3)^{1/2} - 10a^3b^6c + a^2b^5*(-(4ac - b^2)^3)^{1/2} - 52a^2b^6c^2 + 96a^3b^4c^3 - 66a^4b^2c^4 + 33a^4b^4c^2 - 38a^5b^2c^3 + 12ab^8c + 4a^3b^3c*(-(4ac - b^2)^3)^{1/2} - 4a^3b^3c*(-(4ac - b^2)^3)^{1/2} + 3a^4b^2c^2*(-(4ac - b^2)^3)^{1/2} - 10a^2b^3c^2*(-(4ac - b^2)^3)^{1/2} + 6ab^5c*(-(4ac - b^2)^3)^{1/2})/(2*(16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8ab^2c^9 + 10ab^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{1/2}*(32a^2c^{16} - 64a^2c^{15} - 128a^3c^{14} + 64a^4c^{13} + 96a^5c^{12} - 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144ab^2c^{14} - 200ab^3c^{13} + 184ab^4c^{12} - 56ab^5c^{11} - 8ab^6c^{10} + 288a^2b^3c^{14} + 352a^3b^4c^{13} - 32a^4b^5c^{12} - 320a^2b^2c^{13} + 8a^2b^3c^{12} + 96a^2b^4c^{11} - 8a^2b^5c^{10} - 272a^3b^2c^{12} + 40a^3b^3c^{11} + 8a^3b^4c^{10} - 56a^4b^2c^{11} - 96ab^5c^{15}))}{c^8}*(-(a^2b^8 - b^{10} + 8a^5c^5 + 8a^6c^4 - b^7*(-(4ac - b^2)^3)^{1/2} - 10a^3b^6c + a^2b^5*(-(4ac - b^2)^3)^{1/2} - 52a^2b^6c^2 + 96a^3b^4c^3 - 66a^4b^2c^4 + 33a^4b^4c^2 - 38a^5b^2c^3 + 12ab^8c + 4a^3b^3c*(-(4ac - b^2)^3)^{1/2} - 4a^3b^3c*(-(4ac - b^2)^3)^{1/2} + 3a^4b^2c^2*(-(4ac - b^2)^3)^{1/2} - 10a^2b^3c^2*(-(4ac - b^2)^3)^{1/2} + 6ab^5c*(-(4ac - b^2)^3)^{1/2})/(2*(16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8ab^2c^9 + 10ab^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{1/2} - (2048\tan(x/2)*(8a^2c^{14} - 64a^2c^{13} + 80a^3c^{12} + 168a^4c^{11} - 192a^5c^{10} - 136a^6c^9 + 72a^7c^8 - 2b^2c^{13} + 6b^3c^{12} - 17b^4c^{11} + 33b^5c^{10} - 49b^6c^9 + 61b^7c^8 - 52b^8c^7 + 36b^9c^6 - 17b^{10}c^5 + 17b^{11}c^4 - 17b^{12}c^3 + 17b^{13}c^2 - 17b^{14}c + 17b^{15}))}{c^8}$

$$\begin{aligned}
&9c^6 - 24b^{10}c^5 + 8b^{11}c^4 + 84a^2b^2c^{12} - 178a^3b^3c^{11} + 295a^4b^4c^{10} - 416a^5b^5c^9 + 375a^6b^6c^8 - 308a^7b^7c^7 + 244a^8b^8c^6 - 72a^9b^9c^5 - 8a^{10}b^{10}c^4 + 184a^{11}b^{11}c^3 - 328a^{12}b^{12}c^2 - 16a^{13}b^{13}c \\
&0 + 496a^{14}b^{14}c - 88a^{15}b^{15} - 416a^{16}b^{16} + 770a^{17}b^{17} - 723a^{18}b^{18} + 779a^{19}b^{19} - 732a^{20}b^{20} + 80a^{21}b^{21} + 112a^{22}b^{22} - 8a^{23}b^{23} \\
&+ 180a^{24}b^{24} - 494a^{25}b^{25} + 521a^{26}b^{26} - 424a^{27}b^{27} + 56a^{28}b^{28} + 8a^{29}b^{29} + 234a^{30}b^{30} - 1152a^{31}b^{31} + 416a^{32}b^{32} - 140a^{33}b^{33} - 72a^{34}b^{34} + 64a^{35}b^{35} + 192a^{36}b^{36} + 220a^{37}b^{37} - 256a^{38}b^{38} \\
&+ 24a^{39}b^{39} - 24a^{40}b^{40} + 13a^{41}b^{41}))/c^8 * (- (a^2b^8 - b^{10} + 8a^5c^5 + 8a^6c^4 - b^7 * (- (4ac - b^2)^3)^{1/2} - 10a^3b^6c + a^2b^5 * (- (4ac - b^2)^3)^{1/2} - 52a^2b^6c^2 + 96a^3b^4c^3 - 66a^4b^2c^4 + 33a^4b^4c^2 - 38a^5b^2c^3 + 12a^6b^8c + 4a^3b^3c^3 * (- (4ac - b^2)^3)^{1/2} - 4a^3b^3c^3 * (- (4ac - b^2)^3)^{1/2} + 3a^4b^2c^2 * (- (4ac - b^2)^3)^{1/2} - 10a^2b^3c^2 * (- (4ac - b^2)^3)^{1/2} + 6a^2b^5c * (- (4ac - b^2)^3)^{1/2}))/ (2 * (16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a^2b^2c^9 + 10a^2b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7))^{1/2} * (- (a^2b^8 - b^{10} + 8a^5c^5 + 8a^6c^4 - b^7 * (- (4ac - b^2)^3)^{1/2} - 10a^3b^6c + a^2b^5 * (- (4ac - b^2)^3)^{1/2} - 52a^2b^6c^2 + 96a^3b^4c^3 - 66a^4b^2c^4 + 33a^4b^4c^2 - 38a^5b^2c^3 + 12a^6b^8c + 4a^3b^3c^3 * (- (4ac - b^2)^3)^{1/2} - 4a^3b^3c^3 * (- (4ac - b^2)^3)^{1/2} + 3a^4b^2c^2 * (- (4ac - b^2)^3)^{1/2} - 10a^2b^3c^2 * (- (4ac - b^2)^3)^{1/2} + 6a^2b^5c * (- (4ac - b^2)^3)^{1/2}))/ (2 * (16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a^2b^2c^9 + 10a^2b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7))^{1/2} - (2048 * \tan(x/2) * (20a^{12}b^{12}c - 4b^{13} - 40a^2b^{11} + 40a^3b^{10} - 20a^4b^9 + 4a^5b^8 + 2a^4c^9 - 18a^5c^8 + 38a^6c^7 + 2a^7c^6 - 44a^8c^5 + 12a^9c^4 + b^8c^5 - b^9c^4 + 4b^{10}c^3 - 4b^{11}c^2 - 8a^2b^6c^6 + 4a^2b^7c^5 - 31a^2b^8c^4 + 20a^2b^9c^3 - 20a^2b^{10}c^2 - 160a^2b^{10}c + 320a^3b^9c + 26a^4b^8c^8 - 300a^4b^8c - 84a^5b^7c^7 + 136a^5b^7c + 2a^6b^6c^6 - 24a^6b^6c + 168a^7b^5c^5 - 92a^8b^4c^4 + 20a^2b^4c^7 + 8a^2b^5c^6 + 82a^2b^6c^5 + 6a^2b^7c^4 + 8a^2b^8c^3 - 44a^2b^9c^2 - 16a^3b^2c^8 - 40a^3b^3c^7 - 104a^3b^4c^6 - 132a^3b^5c^5 + 34a^3b^6c^4 + 72a^3b^7c^3 + 460a^3b^8c^2 + 82a^4b^2c^7 + 174a^4b^3c^6 + 41a^4b^4c^5 - 149a^4b^5c^4 - 660a^4b^6c^3 - 900a^4b^7c^2 - 90a^5b^2c^6 + 96a^5b^3c^5 + 541a^5b^4c^4 + 1156a^5b^5c^3 + 764a^5b^6c^2 - 204a^6b^2c^5 - 704a^6b^3c^4 - 840a^6b^4c^3 - 300a^6b^5c^2 + 384a^7b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 24a^8b^{11}c))/c^8 * (- (a^2b^8 - b^{10} + 8a^5c^5 + 8a^6c^4 - b^7 * (- (4ac - b^2)^3)^{1/2} - 10a^3b^6c + a^2b^5 * (- (4ac - b^2)^3)^{1/2} - 52a^2b^6c^2 + 96a^3b^4c^3 - 66a^4b^2c^4 + 33a^4b^4c^2 - 38a^5b^2c^3 + 12a^6b^8c + 4a^3b^3c^3 * (- (4ac - b^2)^3)^{1/2} - 4a^3b^3c^3 * (- (4ac - b^2)^3)^{1/2} + 3a^4b^2c^2 * (- (4ac - b^2)^3)^{1/2} - 10a^2b^3c^2 * (- (4ac - b^2)^3)^{1/2} + 6a^2b^5c * (- (4ac - b^2)^3)^{1/2}))/ (2 * (16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a^2b^2c^9 + 10a^2b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7))^{1/2} * i - (((2048 * (12a^3c^{11} - 28a^4c^{10} - 44a^5c^9 + 72a^6c^8 + 88a^7c^7 + 12a^8c^6 + b^5c^9 - 4b^6c^8 + 10b^7c^7 - 20b^8c^6 + 29b^9c^5 - 30b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 6a^2b^3c^{10} + 27a^2b^4c^9 - 72a^2b^5c^8 + 154a^2b^6c^7 - 238a^2b^7c^6 + 251a^2b^8c^5 - 228a^2b^9c^4 + 98a^2b^{10}c^3 + 20a^2b^{11}c^2 + 8a^2b^{12}c - 68a^3b^3c^{10} + 112a^4b^4c^9 + 100a^5b^5c^8 - 200a^6b^6c^7 - 96a^7b^7c^6 - 47a^8b^8c^5 + 145a^2b^3c^9 - 354a^2b^4c^8 + 612a^2b^5c^7 - 655a^2b^6c^6 + 635a^2b^7c^5 - 202a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 + 239a^3b^2c^9 - 524a^3b^3c^8 + 536a^3b^4c^7 - 564a^3b^5c^6 - 115a^3b^6c^5 + 856a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9c^2 - 37a^4b^2c^8 + 9a^4b^3c^7 + 583a^4b^4c^6 - 1362a^4b^5c^5 - 152a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 399a^5b^2c^7 + 904a^5b^3c^6 + 394a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 340a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 60a^6b^5c^3 - 340a^6b^6c^2 + 364a^6b^7c^1 + 136a^6b^8c^0)
\end{aligned}$$

$$\begin{aligned}
& 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*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 + 3 \\
& 8*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^1
\end{aligned}$$



$$\begin{aligned}
& 0*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^8*c - 300*a^4 \\
& *b^8*c - 84*a^5*b^8*c^7 + 136*a^5*b^7*c^6 + 2*a^6*b^8*c^6 - 24*a^6*b^6*c^5 + 168*a^7 \\
& *b^8*c^5 - 92*a^8*b^8*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 - 14 \\
& 9*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^3*c^3 * (- (4*a*c - b^2)^3)^{(1/2)} - 4*a^3*b^3*c^3 * (- (4*a*c - b^2)^3)^{(1/2)} \\
& + 3*a^4*b^3*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)} * i) / ((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^6*c + 4*a^5*b^6*c + 6*a^6*b^5*c - 40*a^6 \\
& *b^5*c + 4*a^7*b^4*c + 56*a^7*b^4*c - 22*a^8*b^3*c - 28*a^8*b^3*c + 12*a^9 \\
& *b^2*c + 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 + (((204 \\
& 8 * (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^6*c^{11} - 68*a^3*b^6*c^{10} + 112*a^4*b^6*c^9 + 1 \\
& 00*a^5*b^6*c^8 - 200*a^6*b^6*c^7 - 96*a^7*b^6*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^6*c^{13} - 144*a^2 \\
& *b^7*c^{12} - 352*a^2*b^8*c^{11} - 144*a^2*b^9*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^3*c^3 * (- (4*a*c - b^2)^3)^{(1/2)} - 4*a^3*b^3*c^3 * (- (4*a*c - b^2)^3)^{(1/2)} + \\
& 3*a^4*b^3*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^6*c^{14} + 352*a^3*b^6 \\
& *c^{13} - 32*a^4*b^6*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
\end{aligned}$$

$$\begin{aligned}
& (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} - 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)*(-(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)} + (((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
\end{aligned}$$

$$\begin{aligned}
& - 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 \\
& - 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
\end{aligned}$$

$$\begin{aligned}
& + 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^3 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^2 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^8 c - 300 a^4 b^8 c - 84 a^5 b^7 c^7 + 136 a^5 b^7 c + 2 a^6 b^6 c^6 - 24 a^6 b^6 c + 168 a^7 b^5 c^5 - 92 a^8 b^4 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^3 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^2 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^3 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^2 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) * (2b - c)) / c^2 + (\tan(x/2)^3 * (2b + c)) / c^2 ) / ( 2 * \tan(x/2)^2 + \tan(x/2)^4 + 1 ) + \operatorname{atan}(\frac{(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^3 c^{11} - 68 a^3 b^3 c^{10} + 112 a^4 b^3 c^9 + 100 a^5 b^3 c^8 - 200 a^6 b^3 c^7 - 96 a^7 b^3 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 * (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^3 c^{13} - 144 a^3 b^3 c^{12} - 352 a^4 b^3 c^{11} - 144 a^5 b^3 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^8
\end{aligned}$$

$$\begin{aligned}
&^{\wedge}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) \\
&^{\wedge}(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^
\end{aligned}$$

$$\begin{aligned}
& 2 - 90a^5b^2c^6 + 96a^5b^3c^5 + 541a^5b^4c^4 + 1156a^5b^5c^3 + 764a^5b^6c^2 - 204a^6b^2c^5 - 704a^6b^3c^4 - 840a^6b^4c^3 - 300 \\
& a^6b^5c^2 + 384a^7b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 24a^8b^3c^2 + 24a^8b^4c^2 - 32a^8b^5c^2 \\
& + 24a^8b^6c^2 + 24a^8b^7c^2) / c^8 * ((b^{10} - a^2b^8 - 8a^5c^5 - 8a^6c^4 - b^7 \\
& * (-4ac - b^2)^3)^{1/2} + 10a^3b^6c + a^2b^5 * (-4ac - b^2)^3)^{1/2} \\
& + 52a^2b^6c^2 - 96a^3b^4c^3 + 66a^4b^2c^4 - 33a^4b^4c^2 + 38a^ \\
& ^5b^2c^3 - 12a^5b^8c + 4a^3b^3c^3 * (-4ac - b^2)^3)^{1/2} - 4a^3b^3c \\
& * (-4ac - b^2)^3)^{1/2} + 3a^4b^3c^2 * (-4ac - b^2)^3)^{1/2} - 10a^2b \\
& ^3c^2 * (-4ac - b^2)^3)^{1/2} + 6a^2b^5c * (-4ac - b^2)^3)^{1/2} / (2 * ( \\
& 16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a^2b^2c^9 + 1 \\
& 0a^2b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{1/2} * i - (( \\
& (2048 * (12a^3c^{11} - 28a^4c^{10} - 44a^5c^9 + 72a^6c^8 + 88a^7c^7 + 1 \\
& 2a^8c^6 + b^5c^9 - 4b^6c^8 + 10b^7c^7 - 20b^8c^6 + 29b^9c^5 - 30 \\
& b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 6a^2b^3c^{10} + 27a^2b^4c^9 - 72a^2 \\
& b^5c^8 + 154a^2b^6c^7 - 238a^2b^7c^6 + 251a^2b^8c^5 - 228a^2b^9c^4 + 9 \\
& 8a^2b^{10}c^3 + 20a^2b^{11}c^2 + 8a^2b^{12}c - 68a^3b^3c^{10} + 112a^4b^3c^9 \\
& + 100a^5b^3c^8 - 200a^6b^3c^7 - 96a^7b^3c^6 - 47a^8b^3c^5 + 145a^9b^3c^4 \\
& * b^3c^9 - 354a^2b^4c^8 + 612a^2b^5c^7 - 655a^2b^6c^6 + 635a^2b^7 \\
& c^5 - 202a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 + 239a^3b^2c^9 - 524a^3 \\
& b^3c^8 + 536a^3b^4c^7 - 564a^3b^5c^6 - 115a^3b^6c^5 + 856a^3b^7c^4 + 2a^3 \\
& b^8c^3 - 20a^3b^9c^2 - 37a^4b^2c^8 + 9a^4b^3c^7 + 583a^4b^4c^6 - 1362a^4 \\
& b^5c^5 - 152a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 399a^5b^2c^7 + 904a^5 \\
& b^3c^6 + 394a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 340a^6b^2c^6 + 364a^6 \\
& b^3c^5 + 136a^6b^4c^4 - 100a^7b^2c^5) / c^8 + (((2048 * (16a^3c^{13} - 32a^2 \\
& c^{14} + 176a^4c^{12} + 176a^5c^{11} + 48a^6c^{10} - 2b^4c^{12} + 6b^5c^{11} - 18 \\
& b^6c^{10} + 26b^7c^9 - 12b^8c^8 + 16a^2b^2c^{13} - 40a^2b^3c^{12} + 122a^2 \\
& b^4c^{11} - 192a^2b^5c^{10} + 74a^2b^6c^9 + 20a^2b^7c^8 + 64a^2b^8c^7 - \\
& 144a^3b^3c^{12} - 352a^4b^3c^{11} - 144a^5b^3c^{10} - 204a^2b^2c^{12} + 388a^ \\
& ^2b^3c^{11} - 50a^2b^4c^{10} - 182a^2b^5c^9 + 4a^2b^6c^8 - 260a^3b^2 \\
& ^2c^{11} + 496a^3b^3c^{10} + 10a^3b^4c^9 - 20a^3b^5c^8 - 148a^4b^2c^{10} + 116 \\
& a^4b^3c^9 + 8a^4b^4c^8 - 44a^5b^2c^9) / c^8 + (2048 * \tan(x/2) * ((b^{10} - a^2 \\
& b^8 - 8a^5c^5 - 8a^6c^4 - b^7 * (-4ac - b^2)^3)^{1/2} + 10a^3b^6c + a^2b^5 \\
& * (-4ac - b^2)^3)^{1/2} + 52a^2b^6c^2 - 96a^3b^4c^3 + 66a^4b^2c^4 - 33a^4 \\
& b^4c^2 + 38a^5b^2c^3 - 12a^5b^8c + 4a^3b^3c^3 * (-4ac - b^2)^3)^{1/2} - 4 \\
& a^3b^3c^3 * (-4ac - b^2)^3)^{1/2} + 3a^4b^3c^2 * (-4ac - b^2)^3)^{1/2} - 10 \\
& a^2b^3c^2 * (-4ac - b^2)^3)^{1/2} + 6a^2b^5c * (-4ac - b^2)^3)^{1/2} / (2 * ( \\
& 16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a^2b^2c^9 + 10a^2b^4 \\
& c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{1/2} * (32a^2c^{16} - 64a^2 \\
& c^{15} - 128a^3c^{14} + 64a^4c^{13} + 96a^5c^{12} - 8b^2c^{15} + 24b^3c^{14} - 32b^4 \\
& c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144a^2b^2c^{14} - 200a^2b^3c^{13} \\
& + 184a^2b^4c^{12} - 56a^2b^5c^{11} - 8a^2b^6c^{10} + 288a^2b^7c^9 + 352a^2 \\
& b^8c^8 - 32a^4b^3c^{12} - 320a^2b^2c^{13} + 8a^2b^3c^{12} + 96a^2b^4c^{11} - 8a^2 \\
& b^5c^{10} - 272a^3b^2c^{12} + 40a^3b^3c^{11} + 8a^3b^4c^{10} - 56a^4b^2c^{11} - 96 \\
& a^4b^3c^{10} + 96a^5b^3c^9) / c^8 * ((b^{10} - a^2b^8 - 8a^5c^5 - 8a^6 \\
& c^4 - b^7 * (-4ac - b^2)^3)^{1/2} + 10a^3b^6c + a^2b^5 * (-4ac - b^2)^3)^{1/2} \\
& + 52a^2b^6c^2 - 96a^3b^4c^3 + 66a^4b^2c^4 - 33a^4b^4c^2 + 38a^5b^2c^3 - 12 \\
& a^5b^8c + 4a^3b^3c^3 * (-4ac - b^2)^3)^{1/2} - 4a^3b^3c^3 * (-4ac - b^2)^3)^{1/2} \\
& + 3a^4b^3c^2 * (-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2 * (-4ac - b^2)^3)^{1/2} + 6 \\
& a^2b^5c * (-4ac - b^2)^3)^{1/2} / (2 * (16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4 \\
& c^8 - b^6c^6 - 8a^2b^2c^9 + 10a^2b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2 \\
& c^7)))^{1/2} + (2048 * \tan(x/2) * (8a^2c^{14} - 64a^2c^{13} + 80a^3c^{12} + 168a^4 \\
& c^{11} - 192a^5c^{10} - 136a^6c^9 + 72a^7c^8 - 2b^2c^{13} + 6b^3c^{12} - 17b^4 \\
& c^{11} + 33b^5c^{10} - 49b^6c^9 + 61b^7c^8 - 52b^8c^7 + 36b^9c^6 - 24b^{10} \\
& c^5 + 8b^{11}c^4 + 84a^2b^2c^{12} - 178a^2b^3c^{11} + 295a^2b^4c^{10} - 416a^2 \\
& b^5c^9 + 375a^2b^6c^8 - 308a^2b^7c^7 + 244a^2b^8c^6 - 72a^2b^9c^5 - 8a^2 \\
& b^{10}c^4 + 184a^2b^{11}c^3 - 328a^3b^3c^{11} - 16a^4b^3c^{10} + 496a^4
\end{aligned}$$

$$\begin{aligned}
& 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 + 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} * i) / ((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 + 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 - 104*a^4*b^3*c^6 + 104*a^4*b^4*c^5 - 44*a^4*b^5*c^4 + 12*a^4*b^6*c^3 - 4*a^4*b^7*c^2 - 4*a^4*b^8*c - 4*a^4*c^9 + 4*a^5*b^2*c^6 - 4*a^5*b^3*c^5 + 4*a^5*b^4*c^4 - 4*a^5*b^5*c^3 - 4*a^5*b^6*c^2 - 4*a^5*b^7*c - 4*a^5*c^8 + 4*a^6*b^2*c^5 - 4*a^6*b^3*c^4 - 4*a^6*b^4*c^3 - 4*a^6*b^5*c^2 - 4*a^6*b^6*c - 4*a^6*c^7 + 4*a^7*b^2*c^4 - 4*a^7*b^3*c^3 - 4*a^7*b^4*c^2 - 4*a^7*b^5*c - 4*a^7*c^6 + 4*a^8*b^2*c^3 - 4*a^8*b^3*c^2 - 4*a^8*b^4*c - 4*a^8*c^5 + 4*a^9*b^2*c^2 - 4*a^9*b^3*c - 4*a^9*c^4 + 4*a^{10}*c^3 - 4*a^{11}*c^2 + 4*a^{12}*c - 4*a^{13}))/c^8
\end{aligned}$$

$$\begin{aligned}
& b^3c^7 + 583a^4b^4c^6 - 1362a^4b^5c^5 - 152a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 399a^5b^2c^7 + 904a^5b^3c^6 + 394a^5b^4c^5 \\
& - 388a^5b^5c^4 - 60a^5b^6c^3 - 340a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 100a^7b^2c^5)/c^8 + (((2048*(16a^3c^{13} - 32a^2c^{14} \\
& + 176a^4c^{12} + 176a^5c^{11} + 48a^6c^{10} - 2b^4c^{12} + 6b^5c^{11} - 18 \\
& *b^6c^{10} + 26b^7c^9 - 12b^8c^8 + 16a*b^2c^{13} - 40a*b^3c^{12} + 122a \\
& *b^4c^{11} - 192a*b^5c^{10} + 74a*b^6c^9 + 20a*b^7c^8 + 64a^2b*c^{13} - \\
& 144a^3b*c^{12} - 352a^4b*c^{11} - 144a^5b*c^{10} - 204a^2b^2c^{12} + 388a \\
& ^2b^3c^{11} - 50a^2b^4c^{10} - 182a^2b^5c^9 + 4a^2b^6c^8 - 260a^3b \\
& ^2c^{11} + 496a^3b^3c^{10} + 10a^3b^4c^9 - 20a^3b^5c^8 - 148a^4b^2c \\
& ^{10} + 116a^4b^3c^9 + 8a^4b^4c^8 - 44a^5b^2c^9))/c^8 - (2048*\tan(x \\
& /2)*((b^{10} - a^2b^8 - 8a^5c^5 - 8a^6c^4 - b^7*(-(4a*c - b^2)^3)^{(1/2)} \\
& + 10a^3b^6c + a^2b^5*(-(4a*c - b^2)^3)^{(1/2)} + 52a^2b^6c^2 - 96a^ \\
& 3b^4c^3 + 66a^4b^2c^4 - 33a^4b^4c^2 + 38a^5b^2c^3 - 12a*b^8c + \\
& 4a^3b*c^3*(-(4a*c - b^2)^3)^{(1/2)} - 4a^3b^3c*(-(4a*c - b^2)^3)^{(1/2)} \\
& ) + 3a^4b*c^2*(-(4a*c - b^2)^3)^{(1/2)} - 10a^2b^3c^2*(-(4a*c - b^2)^3 \\
& )^{(1/2)} + 6a*b^5c*(-(4a*c - b^2)^3)^{(1/2)))/(2*(16a^2c^{10} + 32a^3c^9 \\
& + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a*b^2c^9 + 10a*b^4c^7 - 32a^2b^2c \\
& ^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{(1/2)}*(32a*c^{16} - 64a^2c^{15} - 128a \\
& ^3c^{14} + 64a^4c^{13} + 96a^5c^{12} - 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{1 \\
& 3} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144a*b^2c^{14} - 200a*b^3c^{1 \\
& 3} + 184a*b^4c^{12} - 56a*b^5c^{11} - 8a*b^6c^{10} + 288a^2b*c^{14} + 352a^ \\
& 3b*c^{13} - 32a^4b*c^{12} - 320a^2b^2c^{13} + 8a^2b^3c^{12} + 96a^2b^4c \\
& ^{11} - 8a^2b^5c^{10} - 272a^3b^2c^{12} + 40a^3b^3c^{11} + 8a^3b^4c^{10} \\
& - 56a^4b^2c^{11} - 96a*b*c^{15}))/c^8)*((b^{10} - a^2b^8 - 8a^5c^5 - 8a^6 \\
& *c^4 - b^7*(-(4a*c - b^2)^3)^{(1/2)} + 10a^3b^6c + a^2b^5*(-(4a*c - b^2 \\
& )^3)^{(1/2)} + 52a^2b^6c^2 - 96a^3b^4c^3 + 66a^4b^2c^4 - 33a^4b^4c \\
& ^2 + 38a^5b^2c^3 - 12a*b^8c + 4a^3b*c^3*(-(4a*c - b^2)^3)^{(1/2)} - \\
& 4a^3b^3c*(-(4a*c - b^2)^3)^{(1/2)} + 3a^4b*c^2*(-(4a*c - b^2)^3)^{(1/2)} \\
& - 10a^2b^3c^2*(-(4a*c - b^2)^3)^{(1/2)} + 6a*b^5c*(-(4a*c - b^2)^3)^{( \\
& 1/2)))/(2*(16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a*b \\
& ^2c^9 + 10a*b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{(1/ \\
& 2)} - (2048*\tan(x/2)*(8a*c^{14} - 64a^2c^{13} + 80a^3c^{12} + 168a^4c^{11} - \\
& 192a^5c^{10} - 136a^6c^9 + 72a^7c^8 - 2b^2c^{13} + 6b^3c^{12} - 17b^4c \\
& ^{11} + 33b^5c^{10} - 49b^6c^9 + 61b^7c^8 - 52b^8c^7 + 36b^9c^6 - 24 \\
& *b^{10}c^5 + 8b^{11}c^4 + 84a*b^2c^{12} - 178a*b^3c^{11} + 295a*b^4c^{10} - \\
& 416a*b^5c^9 + 375a*b^6c^8 - 308a*b^7c^7 + 244a*b^8c^6 - 72a*b^9c^ \\
& 5 - 8a*b^{10}c^4 + 184a^2b*c^{12} - 328a^3b*c^{11} - 16a^4b*c^{10} + 496a^ \\
& 5b*c^9 - 88a^6b*c^8 - 416a^2b^2c^{11} + 770a^2b^3c^{10} - 723a^2b^4c \\
& ^9 + 779a^2b^5c^8 - 732a^2b^6c^7 + 80a^2b^7c^6 + 112a^2b^8c^5 \\
& - 8a^2b^9c^4 + 180a^3b^2c^{10} - 494a^3b^3c^9 + 521a^3b^4c^8 + 57 \\
& 2a^3b^5c^7 - 424a^3b^6c^6 + 56a^3b^7c^5 + 8a^3b^8c^4 + 234a^4b \\
& ^2c^9 - 1152a^4b^3c^8 + 416a^4b^4c^7 - 140a^4b^5c^6 - 72a^4b^6 \\
& *c^5 + 64a^5b^2c^8 + 192a^5b^3c^7 + 220a^5b^4c^6 - 256a^6b^2c^7 \\
& - 24a*b*c^{13}))/c^8)*((b^{10} - a^2b^8 - 8a^5c^5 - 8a^6c^4 - b^7*(-(4a \\
& *c - b^2)^3)^{(1/2)} + 10a^3b^6c + a^2b^5*(-(4a*c - b^2)^3)^{(1/2)} + 52a \\
& ^2b^6c^2 - 96a^3b^4c^3 + 66a^4b^2c^4 - 33a^4b^4c^2 + 38a^5b^2c \\
& ^3 - 12a*b^8c + 4a^3b*c^3*(-(4a*c - b^2)^3)^{(1/2)} - 4a^3b^3c*(-(4 \\
& a*c - b^2)^3)^{(1/2)} + 3a^4b*c^2*(-(4a*c - b^2)^3)^{(1/2)} - 10a^2b^3c^2 \\
& *(-(4a*c - b^2)^3)^{(1/2)} + 6a*b^5c*(-(4a*c - b^2)^3)^{(1/2)))/(2*(16a^2c \\
& ^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a*b^2c^9 + 10a*b^4 \\
& *c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{(1/2)})*((b^{10} - a^2b \\
& ^8 - 8a^5c^5 - 8a^6c^4 - b^7*(-(4a*c - b^2)^3)^{(1/2)} + 10a^3b^6c + \\
& a^2b^5*(-(4a*c - b^2)^3)^{(1/2)} + 52a^2b^6c^2 - 96a^3b^4c^3 + 66a^ \\
& 4b^2c^4 - 33a^4b^4c^2 + 38a^5b^2c^3 - 12a*b^8c + 4a^3b*c^3*(-(4 \\
& a*c - b^2)^3)^{(1/2)} - 4a^3b^3c*(-(4a*c - b^2)^3)^{(1/2)} + 3a^4b*c^2*( \\
& -(4a*c - b^2)^3)^{(1/2)} - 10a^2b^3c^2*(-(4a*c - b^2)^3)^{(1/2)} + 6a*b^5 \\
& *c*(-(4a*c - b^2)^3)^{(1/2)))/(2*(16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^ \\
& 4c^8 - b^6c^6 - 8a*b^2c^9 + 10a*b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6
\end{aligned}$$



$$\begin{aligned}
& - 8a^3b^2c^7))^{(1/2)} - (2048 \tan(x/2) * (20a^3b^{12} + 4b^{12}c - 4b^{13} - \\
& 40a^2b^{11} + 40a^3b^{10} - 20a^4b^9 + 4a^5b^8 + 2a^4c^9 - 18a^5c^8 \\
& + 38a^6c^7 + 2a^7c^6 - 44a^8c^5 + 12a^9c^4 + b^8c^5 - b^9c^4 + \\
& 4b^{10}c^3 - 4b^{11}c^2 - 8a^8b^6c^6 + 4a^8b^7c^5 - 31a^8b^8c^4 + 20a^8b^9c^3 \\
& - 20a^8b^{10}c^2 - 160a^2b^{10}c + 320a^3b^9c + 26a^4b^8c - 300a^4b^8c \\
& - 84a^5b^7c + 136a^5b^7c + 2a^6b^6c - 24a^6b^6c + 168a^7b^5c \\
& - 92a^8b^4c + 20a^2b^4c^7 + 8a^2b^5c^6 + 82a^2b^6c^5 + 6a^2b^7c^4 \\
& + 8a^2b^8c^3 - 44a^2b^9c^2 - 16a^3b^2c^8 - 40a^3b^3c^7 - 104a^3b^4c^6 \\
& - 132a^3b^5c^5 + 34a^3b^6c^4 + 72a^3b^7c^3 + 460a^3b^8c^2 + 82a^4b^2c^7 \\
& + 174a^4b^3c^6 + 41a^4b^4c^5 - 149a^4b^5c^4 - 660a^4b^6c^3 - 900a^4b^7c^2 \\
& - 90a^5b^2c^6 + 96a^5b^3c^5 + 541a^5b^4c^4 + 1156a^5b^5c^3 + 764a^5b^6c^2 - 204a^6b^2c^5 \\
& - 704a^6b^3c^4 - 840a^6b^4c^3 - 300a^6b^5c^2 + 384a^7b^2c^4 + 272a^7b^3c^3 \\
& + 44a^7b^4c^2 - 32a^8b^2c^3 + 24a^8b^{11}c) / c^8) * ((b^{10} - a^2b^8 - 8a^5c^5 - 8a^6c^4 - b^7 * (-4ac - b^2)^3)^{(1/2)} \\
& + 10a^3b^6c + a^2b^5 * (-4ac - b^2)^3)^{(1/2)} + 52a^2b^6c^2 - 96a^3b^4c^3 \\
& + 66a^4b^2c^4 - 33a^4b^4c^2 + 38a^5b^2c^3 - 12a^8b^8c + 4a^3b^3c^3 * (-4ac - b^2)^3)^{(1/2)} \\
& - 4a^3b^3c^3 * (-4ac - b^2)^3)^{(1/2)} + 3a^4b^3c^2 * (-4ac - b^2)^3)^{(1/2)} - 10a^2b^3c^2 * (-4ac - b^2)^3)^{(1/2)} \\
& + 6a^8b^5c * (-4ac - b^2)^3)^{(1/2)}) / (2 * (16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a^8b^2c^9 \\
& + 10a^8b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7))^{(1/2)} + (((2048 * (12a^3c^{11} - 28a^4c^{10} \\
& - 44a^5c^9 + 72a^6c^8 + 88a^7c^7 + 12a^8c^6 + b^5c^9 - 4b^6c^8 + 10b^7c^7 - 20b^8c^6 \\
& + 29b^9c^5 - 30b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 6a^8b^3c^{10} + 27a^8b^4c^9 - 72a^8b^5c^8 \\
& + 154a^8b^6c^7 - 238a^8b^7c^6 + 251a^8b^8c^5 - 228a^8b^9c^4 + 98a^8b^{10}c^3 + 20a^8b^{11}c^2 \\
& + 8a^2b^8c^{11} - 68a^3b^8c^{10} + 112a^4b^8c^9 + 100a^5b^8c^8 - 200a^6b^8c^7 - 96a^7b^8c^6 \\
& - 47a^2b^2c^{10} + 145a^2b^3c^9 - 354a^2b^4c^8 + 612a^2b^5c^7 - 655a^2b^6c^6 + 635a^2b^7c^5 \\
& - 202a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 + 239a^3b^2c^9 - 524a^3b^3c^8 + 536a^3b^4c^7 \\
& - 564a^3b^5c^6 - 115a^3b^6c^5 + 856a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9c^2 - 37a^4b^2c^8 \\
& + 9a^4b^3c^7 + 583a^4b^4c^6 - 1362a^4b^5c^5 - 152a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 399a^5b^2c^7 \\
& + 904a^5b^3c^6 + 394a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 340a^6b^2c^6 + 364a^6b^3c^5 \\
& + 136a^6b^4c^4 - 100a^7b^2c^5)) / c^8 + (((2048 * (16a^3c^{13} - 32a^2c^{14} + 176a^4c^{12} + 176a^5c^{11} \\
& + 48a^6c^{10} - 2b^4c^{12} + 6b^5c^{11} - 18b^6c^{10} + 26b^7c^9 - 12b^8c^8 + 16a^8b^2c^{13} \\
& - 40a^8b^3c^{12} + 122a^8b^4c^{11} - 192a^8b^5c^{10} + 74a^8b^6c^9 + 20a^8b^7c^8 + 64a^2b^8c^{13} \\
& - 144a^3b^8c^{12} - 352a^4b^8c^{11} - 144a^5b^8c^{10} - 204a^2b^2c^{12} + 388a^2b^3c^{11} - 50a^2b^4c^{10} \\
& - 182a^2b^5c^9 + 4a^2b^6c^8 - 260a^3b^2c^{11} + 496a^3b^3c^{10} + 10a^3b^4c^9 - 20a^3b^5c^8 \\
& - 148a^4b^2c^{10} + 116a^4b^3c^9 + 8a^4b^4c^8 - 44a^5b^2c^9)) / c^8 + (2048 \tan(x/2) * ((b^{10} - a^2b^8 - 8a^5c^5 \\
& - 8a^6c^4 - b^7 * (-4ac - b^2)^3)^{(1/2)} + 10a^3b^6c + a^2b^5 * (-4ac - b^2)^3)^{(1/2)} \\
& + 52a^2b^6c^2 - 96a^3b^4c^3 + 66a^4b^2c^4 - 33a^4b^4c^2 + 38a^5b^2c^3 - 12a^8b^8c + 4a^3b^3c^3 * (-4ac - b^2)^3)^{(1/2)} \\
& - 4a^3b^3c^3 * (-4ac - b^2)^3)^{(1/2)} + 3a^4b^3c^2 * (-4ac - b^2)^3)^{(1/2)} - 10a^2b^3c^2 * (-4ac - b^2)^3)^{(1/2)} \\
& + 6a^8b^5c * (-4ac - b^2)^3)^{(1/2)}) / (2 * (16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8a^8b^2c^9 \\
& + 10a^8b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7))^{(1/2)} * (32a^3c^{16} - 64a^2c^{15} - 128a^3c^{14} + 64a^4c^{13} + 96a^5c^{12} \\
& - 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144a^8b^2c^{14} - 200a^8b^3c^{13} \\
& + 184a^8b^4c^{12} - 56a^8b^5c^{11} - 8a^8b^6c^{10} + 288a^2b^8c^{14} + 352a^3b^8c^{13} - 32a^4b^8c^{12} - 320a^2b^2c^{13} \\
& + 8a^2b^3c^{12} + 96a^2b^4c^{11} - 8a^2b^5c^{10} - 272a^3b^2c^{12} + 40a^3b^3c^{11} + 8a^3b^4c^{10} - 56a^4b^2c^{11} - 96a^8b^8c^{15})) / c^8) * ((b^{10} - a^2b^8 - 8a^5c^5 - 8a^6c^4 - b^7 * (-4ac - b^2)^3)^{(1/2)} \\
& + 10a^3b^6c + a^2b^5 * (-4ac - b^2)^3)^{(1/2)} + 52a^2b^6c^2 - 96a^3b^4c^3 + 66a^4b^2c^4 - 33a^4b^4c^2 + 38a^5b^2c^3 - 12
\end{aligned}$$

$$\begin{aligned}
& *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 + 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)}
\end{aligned}$$

$$\begin{aligned}
& *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} + (\operatorname{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^ \\
& 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^ \\
& 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} + 1 \\
& 22*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} + 3 \\
& 88*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*t \\
& \operatorname{an}(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*2 \\
& i - 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 - 1
\end{aligned}$$

$$\begin{aligned}
& 8a^5c^8 + 38a^6c^7 + 2a^7c^6 - 44a^8c^5 + 12a^9c^4 + b^8c^5 - b^9c^4 + 4b^{10}c^3 - 4b^{11}c^2 - 8a^8b^6c^6 + 4a^8b^7c^5 - 31a^8b^8c^4 \\
& + 20a^8b^9c^3 - 20a^8b^{10}c^2 - 160a^8b^{11}c + 320a^9b^9c + 26a^9b^{10}c^2 - 300a^9b^{11}c^3 - 84a^{10}b^8c^4 + 136a^{10}b^9c^3 + 2a^{10}b^{10}c^2 - 24a^{10}b^{11}c \\
& + 168a^{11}b^8c^3 - 92a^{11}b^9c^2 + 20a^{11}b^{10}c + 8a^{11}b^{11}c^2 + 82a^{12}b^8c^4 + 6a^{12}b^9c^3 + 8a^{12}b^{10}c^2 - 44a^{12}b^{11}c + 16a^{13}b^8c^4 - 40a^{13}b^9c^3 \\
& - 104a^{13}b^{10}c^2 - 132a^{13}b^{11}c + 34a^{14}b^8c^4 + 72a^{14}b^9c^3 + 460a^{14}b^{10}c^2 + 82a^{14}b^{11}c + 174a^{15}b^8c^4 + 41a^{15}b^9c^3 + 149a^{15}b^{10}c^2 - 149a^{15}b^{11}c \\
& - 660a^{16}b^8c^4 - 900a^{16}b^9c^3 - 90a^{16}b^{10}c^2 + 96a^{16}b^{11}c + 541a^{17}b^8c^4 + 1156a^{17}b^9c^3 + 764a^{17}b^{10}c^2 - 204a^{17}b^{11}c - 704a^{18}b^8c^4 - 840a^{18}b^9c^3 \\
& - 300a^{18}b^{10}c^2 + 384a^{18}b^{11}c + 272a^{19}b^8c^4 + 44a^{19}b^9c^3 - 32a^{19}b^{10}c^2 + 24a^{19}b^{11}c)/c^8 + (((2048*(12a^3c^11 - 28a^4c^10 - 44a^5c^9 + 72a^6c^8 + 88a^7c^7 + 12a^8c^6 + b^5c^9 - 4b^6c^8 + 10b^7c^7 - 20b^8c^6 + 29b^9c^5 - 30b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 6a^8b^3c^10 + 27a^8b^4c^9 - 72a^8b^5c^8 + 154a^8b^6c^7 - 238a^8b^7c^6 + 251a^8b^8c^5 - 228a^8b^9c^4 + 98a^8b^{10}c^3 + 20a^8b^{11}c^2 + 8a^9b^3c^11 - 68a^9b^4c^10 + 112a^9b^5c^9 + 100a^9b^6c^8 - 200a^9b^7c^7 - 96a^9b^8c^6 - 47a^9b^9c^5 + 145a^9b^{10}c^4 - 354a^9b^{11}c^3 + 612a^9b^{12}c^2 - 655a^9b^{13}c + 635a^{10}b^3c^11 - 202a^{10}b^4c^10 - 222a^{10}b^5c^9 + 4a^{10}b^6c^8 + 239a^{10}b^7c^7 - 524a^{10}b^8c^6 + 536a^{10}b^9c^5 - 564a^{10}b^{10}c^4 - 115a^{10}b^{11}c^3 + 856a^{10}b^{12}c^2 + 2a^{10}b^{13}c + 20a^{11}b^3c^11 - 20a^{11}b^4c^10 - 37a^{11}b^5c^9 + 9a^{11}b^6c^8 + 583a^{11}b^7c^7 - 1362a^{11}b^8c^6 - 152a^{11}b^9c^5 + 156a^{11}b^{10}c^4 + 8a^{11}b^{11}c^3 - 399a^{11}b^{12}c^2 + 904a^{11}b^{13}c + 394a^{12}b^3c^11 - 388a^{12}b^4c^10 - 60a^{12}b^5c^9 - 340a^{12}b^6c^8 + 364a^{12}b^7c^7 + 136a^{12}b^8c^6 - 100a^{12}b^9c^5)/c^8 + (((2048*tan(x/2))*(8a^14c^14 - 64a^14c^13 + 80a^14c^12 + 168a^14c^11 - 192a^14c^10 - 136a^14c^9 + 72a^14c^8 - 2b^2c^13 + 6b^3c^12 - 17b^4c^11 + 33b^5c^10 - 49b^6c^9 + 61b^7c^8 - 52b^8c^7 + 36b^9c^6 - 24b^{10}c^5 + 8b^{11}c^4 + 84a^8b^2c^12 - 178a^8b^3c^11 + 295a^8b^4c^10 - 416a^8b^5c^9 + 375a^8b^6c^8 - 308a^8b^7c^7 + 244a^8b^8c^6 - 72a^8b^9c^5 - 8a^8b^{10}c^4 + 184a^8b^{11}c^3 - 328a^9b^3c^11 - 16a^9b^4c^10 + 496a^9b^5c^9 - 88a^9b^6c^8 - 416a^9b^7c^7 + 770a^9b^8c^6 - 723a^9b^9c^5 + 779a^9b^{10}c^4 - 732a^9b^{11}c^3 + 80a^9b^{12}c^2 + 112a^9b^{13}c + 8a^9b^{14}c + 180a^{10}b^3c^11 - 494a^{10}b^4c^10 + 521a^{10}b^5c^9 + 572a^{10}b^6c^8 - 424a^{10}b^7c^7 + 56a^{10}b^8c^6 + 8a^{10}b^9c^5 + 234a^{10}b^{10}c^4 - 1152a^{10}b^{11}c^3 + 416a^{10}b^{12}c^2 - 140a^{10}b^{13}c + 72a^{10}b^{14}c + 64a^{11}b^3c^11 + 192a^{11}b^4c^10 + 220a^{11}b^5c^9 - 256a^{11}b^6c^8 - 24a^{11}b^7c^7 + 220a^{11}b^8c^6 - 256a^{11}b^9c^5 - 24a^{11}b^{10}c^4 + 192a^{11}b^{11}c^3)/c^8 + (((2048*(16a^3c^13 - 32a^2c^14 + 176a^4c^12 + 176a^5c^11 + 48a^6c^10 - 2b^4c^12 + 6b^5c^11 - 18b^6c^10 + 26b^7c^9 - 12b^8c^8 + 16a^8b^2c^13 - 40a^8b^3c^12 + 122a^8b^4c^11 - 192a^8b^5c^10 + 74a^8b^6c^9 + 20a^8b^7c^8 + 64a^8b^8c^7 - 144a^8b^9c^6 - 352a^8b^{10}c^5 - 144a^8b^{11}c^4 + 204a^9b^2c^13 - 204a^9b^3c^12 + 388a^9b^4c^11 - 50a^9b^5c^10 - 182a^9b^6c^9 + 4a^9b^7c^8 - 260a^9b^8c^7 + 496a^9b^9c^6 + 10a^9b^{10}c^5 - 20a^9b^{11}c^4 - 20a^9b^{12}c^3 - 148a^9b^{13}c^2 + 116a^9b^{14}c + 8a^{10}b^3c^11 - 44a^{10}b^4c^10 - 256a^{10}b^5c^9 + 220a^{10}b^6c^8 - 256a^{10}b^7c^7 - 24a^{10}b^8c^6 - 24a^{10}b^9c^5 + 192a^{10}b^{10}c^4 + 144a^{10}b^{11}c^3 - 144a^{10}b^{12}c^2 + 144a^{10}b^{13}c + 144a^{11}b^3c^11 - 200a^{11}b^4c^10 + 184a^{11}b^5c^9 - 56a^{11}b^6c^8 - 8a^{11}b^7c^7 + 288a^{11}b^8c^6 + 352a^{11}b^9c^5 - 32a^{11}b^{10}c^4 - 320a^{11}b^{11}c^3 + 8a^{12}b^3c^11 + 96a^{12}b^4c^10 - 8a^{12}b^5c^9 - 272a^{12}b^6c^8 + 40a^{12}b^7c^7 + 8a^{12}b^8c^6 + 8a^{12}b^9c^5 - 56a^{12}b^{10}c^4 - 96a^{12}b^{11}c^3)/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))*((4096*(16a^5b^7 - 4a^4b^8 - 24a^6b^6 + 16a^7b^5 - 4a^8b^4 + 3a^6c^6 - 10a^7c^5 + a^8c^4 + 14a^9c^3 + 4a^4b^7c - 2a^5b^6c + 4a^5b^6c + 6a^6b^5c - 40a^6b^5c + 4a^7b^4c + 56a^7b^4c - 22a^8b^3c - 28a^8b^3c + 12a^9b^2c + 4a^9b^2c + a^4b^3c^5 - a^4b^4c^4 + 4a^4b^5c^3 - 4a^4b^6c^2 - a^5b^2c^5 - 8a^5b^3c^4 + 10a^6b^2c^4
\end{aligned}$$

$$\begin{aligned}
& - 4a^6b^3c^3 - 8a^6b^4c^2 + 4a^7b^2c^3 + 48a^7b^3c^2 - 48a^8b^2c^2)/c^8 - (((2048\tan(x/2)*(20a^2b^{12} + 4b^{12}c - 4b^{13} - 40a^2b^{11} + 40a^3b^{10} - 20a^4b^9 + 4a^5b^8 + 2a^4c^9 - 18a^5c^8 + 38a^6c^7 + 2a^7c^6 - 44a^8c^5 + 12a^9c^4 + b^8c^5 - b^9c^4 + 4b^{10}c^3 - 4b^{11}c^2 - 8a^6b^6c^6 + 4a^6b^7c^5 - 31a^6b^8c^4 + 20a^6b^9c^3 - 20a^6b^{10}c^2 - 160a^2b^{10}c + 320a^3b^9c + 26a^4b^8c^8 - 300a^4b^8c^5 - 84a^5b^6c^7 + 136a^5b^7c^6 + 2a^6b^6c^6 - 24a^6b^6c^6 + 168a^7b^6c^5 - 92a^8b^6c^4 + 20a^2b^4c^7 + 8a^2b^5c^6 + 82a^2b^6c^5 + 6a^2b^7c^4 + 8a^2b^8c^3 - 44a^2b^9c^2 - 16a^3b^2c^8 - 40a^3b^3c^7 - 104a^3b^4c^6 - 132a^3b^5c^5 + 34a^3b^6c^4 + 72a^3b^7c^3 + 460a^3b^8c^2 + 82a^4b^2c^7 + 174a^4b^3c^6 + 41a^4b^4c^5 - 149a^4b^5c^4 - 660a^4b^6c^3 - 900a^4b^7c^2 - 90a^5b^2c^6 + 96a^5b^3c^5 + 541a^5b^4c^4 + 1156a^5b^5c^3 + 764a^5b^6c^2 - 204a^6b^2c^5 - 704a^6b^3c^4 - 840a^6b^4c^3 - 300a^6b^5c^2 + 384a^7b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 24a^8b^{11}c))/c^8 - (((2048*(12a^3c^{11} - 28a^4c^{10} - 44a^5c^9 + 72a^6c^8 + 88a^7c^7 + 12a^8c^6 + b^5c^9 - 4b^6c^8 + 10b^7c^7 - 20b^8c^6 + 29b^9c^5 - 30b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 6a^3b^3c^{10} + 27a^3b^4c^9 - 72a^3b^5c^8 + 154a^3b^6c^7 - 238a^3b^7c^6 + 251a^3b^8c^5 - 228a^3b^9c^4 + 98a^3b^{10}c^3 + 20a^3b^{11}c^2 + 8a^2b^6c^{11} - 68a^3b^6c^{10} + 112a^4b^6c^9 + 100a^5b^6c^8 - 200a^6b^6c^7 - 96a^7b^6c^6 - 47a^2b^2c^{10} + 145a^2b^3c^9 - 354a^2b^4c^8 + 612a^2b^5c^7 - 655a^2b^6c^6 + 635a^2b^7c^5 - 202a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 + 239a^3b^2c^9 - 524a^3b^3c^8 + 536a^3b^4c^7 - 564a^3b^5c^6 - 115a^3b^6c^5 + 856a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9c^2 - 37a^4b^2c^8 + 9a^4b^3c^7 + 583a^4b^4c^6 - 1362a^4b^5c^5 - 152a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 399a^5b^2c^7 + 904a^5b^3c^6 + 394a^5b^4c^5 - 388a^5b^5c^4 - 60a^5b^6c^3 - 340a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 100a^7b^2c^5))/c^8 - (((2048\tan(x/2)*(8a^2c^{14} - 64a^2c^{13} + 80a^3c^{12} + 168a^4c^{11} - 192a^5c^{10} - 136a^6c^9 + 72a^7c^8 - 2b^2c^{13} + 6b^3c^{12} - 17b^4c^{11} + 33b^5c^{10} - 49b^6c^9 + 61b^7c^8 - 52b^8c^7 + 36b^9c^6 - 24b^{10}c^5 + 8b^{11}c^4 + 84a^2b^2c^{12} - 178a^2b^3c^{11} + 295a^2b^4c^{10} - 416a^2b^5c^9 + 375a^2b^6c^8 - 308a^2b^7c^7 + 244a^2b^8c^6 - 72a^2b^9c^5 - 8a^2b^{10}c^4 + 184a^2b^6c^{12} - 328a^3b^6c^{11} - 16a^4b^6c^{10} + 496a^5b^6c^9 - 88a^6b^6c^8 - 416a^2b^2c^{11} + 770a^2b^3c^{10} - 723a^2b^4c^9 + 779a^2b^5c^8 - 732a^2b^6c^7 + 80a^2b^7c^6 + 112a^2b^8c^5 - 8a^2b^9c^4 + 180a^3b^2c^{10} - 494a^3b^3c^9 + 521a^3b^4c^8 + 572a^3b^5c^7 - 424a^3b^6c^6 + 56a^3b^7c^5 + 8a^3b^8c^4 + 234a^4b^2c^9 - 1152a^4b^3c^8 + 416a^4b^4c^7 - 140a^4b^5c^6 - 72a^4b^6c^5 + 64a^5b^2c^8 + 192a^5b^3c^7 + 220a^5b^4c^6 - 256a^6b^2c^7 - 24a^6b^3c^6))/c^8 - (((2048*(16a^3c^{13} - 32a^2c^{14} + 176a^4c^{12} + 176a^5c^{11} + 48a^6c^{10} - 2b^4c^{12} + 6b^5c^{11} - 18b^6c^{10} + 26b^7c^9 - 12b^8c^8 + 16a^2b^2c^{13} - 40a^2b^3c^{12} + 122a^2b^4c^{11} - 192a^2b^5c^{10} + 74a^2b^6c^9 + 20a^2b^7c^8 + 64a^2b^8c^7 - 144a^3b^6c^{12} - 352a^4b^6c^{11} - 144a^5b^6c^{10} - 204a^2b^2c^{12} + 388a^2b^3c^{11} - 50a^2b^4c^{10} - 182a^2b^5c^9 + 4a^2b^6c^8 - 260a^3b^2c^{11} + 496a^3b^3c^{10} + 10a^3b^4c^9 - 20a^3b^5c^8 - 148a^4b^2c^{10} + 116a^4b^3c^9 + 8a^4b^4c^8 - 44a^5b^2c^9))/c^8 - (1024\tan(x/2)*(b^2*2i - a*c*2i + c^2*1i)*(32a^2c^{16} - 64a^2c^{15} - 128a^3c^{14} + 64a^4c^{13} + 96a^5c^{12} - 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} + 144a^2b^2c^{14} - 200a^2b^3c^{13} + 184a^2b^4c^{12} - 56a^2b^5c^{11} - 8a^2b^6c^{10} + 288a^2b^6c^{14} + 352a^3b^6c^{13} - 32a^4b^6c^{12} - 320a^2b^2c^{13} + 8a^2b^3c^{12} + 96a^2b^4c^{11} - 8a^2b^5c^{10} - 272a^3b^2c^{12} + 40a^3b^3c^{11} + 8a^3b^4c^{10} - 56a^4b^2c^{11} - 96a^4b^3c^{10}))/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) + (((2048\tan(x/2)*(20a^2b^{12} + 4b^{12}c - 4b^{13} - 40a^2b^{11} + 40a^3b^{10} - 20a^4b^9 + 4a^5b^8 + 2a^4c^9 - 18a^5c^8 + 38a^6c^7 + 2a^7c^6 - 44a^8c^5 + 12a^9c^4 +
\end{aligned}$$

$$\begin{aligned}
& b^8c^5 - b^9c^4 + 4b^{10}c^3 - 4b^{11}c^2 - 8a^6b^6c^6 + 4a^7b^7c^5 - 3 \\
& 1a^8b^8c^4 + 20a^9b^9c^3 - 20a^{10}b^{10}c^2 - 160a^{11}b^{11}c + 320a^{12}b^{12}c^0 \\
& + 26a^{13}b^{13}c^8 - 300a^{14}b^{14}c^7 - 84a^{15}b^{15}c^6 + 136a^{16}b^{16}c^5 + 2a^{17}b^{17}c^4 \\
& - 24a^{18}b^{18}c^3 + 168a^{19}b^{19}c^2 - 92a^{20}b^{20}c + 20a^{21}b^{21}c^0 + 8a^{22}b^{22}c^9 \\
& + 82a^{23}b^{23}c^8 + 6a^{24}b^{24}c^7 + 8a^{25}b^{25}c^6 - 44a^{26}b^{26}c^5 - 1 \\
& 6a^{27}b^{27}c^4 - 40a^{28}b^{28}c^3 - 104a^{29}b^{29}c^2 - 132a^{30}b^{30}c + 34a^{31}b^{31}c^0 \\
& + 72a^{32}b^{32}c^9 + 460a^{33}b^{33}c^8 + 82a^{34}b^{34}c^7 + 174a^{35}b^{35}c^6 + 41a^{36}b^{36}c^5 \\
& - 149a^{37}b^{37}c^4 - 660a^{38}b^{38}c^3 - 900a^{39}b^{39}c^2 - 90a^{40}b^{40}c + 96a^{41}b^{41}c^0 \\
& + 541a^{42}b^{42}c^9 + 1156a^{43}b^{43}c^8 + 764a^{44}b^{44}c^7 - 204a^{45}b^{45}c^6 - 704a^{46}b^{46}c^5 \\
& - 840a^{47}b^{47}c^4 - 300a^{48}b^{48}c^3 + 384a^{49}b^{49}c^2 + 272a^{50}b^{50}c + 44a^{51}b^{51}c^0 \\
& - 32a^{52}b^{52}c^9 + 24a^{53}b^{53}c^8)) / c^8 + (((2048(12a^3c^{11} - 28a^4c^{10} - 44a^5c^9 \\
& + 72a^6c^8 + 88a^7c^7 + 12a^8c^6 + b^5c^9 - 4b^6c^8 + 10b^7c^7 \\
& - 20b^8c^6 + 29b^9c^5 - 30b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 6a^3b^{13}c^{10} \\
& + 27a^4b^{14}c^9 - 72a^5b^{15}c^8 + 154a^6b^{16}c^7 - 238a^7b^{17}c^6 + 251 \\
& a^8b^{18}c^5 - 228a^9b^{19}c^4 + 98a^{10}b^{20}c^3 + 20a^{11}b^{21}c^2 + 8a^{12}b^{22}c^1 - \\
& 68a^{13}b^{23}c^0 + 112a^{14}b^{24}c^9 + 100a^{15}b^{25}c^8 - 200a^{16}b^{26}c^7 - 96a^{17}b^{27}c^6 \\
& - 47a^{18}b^{28}c^5 + 145a^{19}b^{29}c^4 - 354a^{20}b^{30}c^3 + 612a^{21}b^{31}c^2 - 655a^{22}b^{32}c^1 \\
& + 635a^{23}b^{33}c^0 - 202a^{24}b^{34}c^9 - 222a^{25}b^{35}c^8 + 4a^{26}b^{36}c^7 + 239a^{27}b^{37}c^6 \\
& - 524a^{28}b^{38}c^5 + 536a^{29}b^{39}c^4 - 564a^{30}b^{40}c^3 - 115a^{31}b^{41}c^2 + 856a^{32}b^{42}c^1 \\
& + 2a^{33}b^{43}c^0 - 20a^{34}b^{44}c^9 * c^2 - 37a^{35}b^{45}c^8 + 9a^{36}b^{46}c^7 + 583a^{37}b^{47}c^6 \\
& - 1362a^{38}b^{48}c^5 - 152a^{39}b^{49}c^4 + 156a^{40}b^{50}c^3 + 8a^{41}b^{51}c^2 - 399a^{42}b^{52}c^1 \\
& + 904a^{43}b^{53}c^0 + 394a^{44}b^{54}c^9 - 388a^{45}b^{55}c^8 - 60a^{46}b^{56}c^7 - 340a^{47}b^{57}c^6 \\
& + 364a^{48}b^{58}c^5 + 136a^{49}b^{59}c^4 - 100a^{50}b^{60}c^3)) / c^8 + (((2 \\
& 048 \tan(x/2) (8a^8c^{14} - 64a^9c^{13} + 80a^{10}c^{12} + 168a^{11}c^{11} - 192a^{12}c^{10} \\
& - 136a^{13}c^9 + 72a^{14}c^8 - 2b^2c^{13} + 6b^3c^{12} - 17b^4c^{11} + \\
& 33b^5c^{10} - 49b^6c^9 + 61b^7c^8 - 52b^8c^7 + 36b^9c^6 - 24b^{10}c^5 \\
& + 8b^{11}c^4 + 84a^2b^2c^{12} - 178a^3b^3c^{11} + 295a^4b^4c^{10} - 416a^5b^5c^9 \\
& + 375a^6b^6c^8 - 308a^7b^7c^7 + 244a^8b^8c^6 - 72a^9b^9c^5 - 8a^{10}b^{10}c^4 \\
& + 184a^{11}b^{11}c^3 - 328a^{12}b^{12}c^2 - 16a^{13}b^{13}c^1 + 496a^{14}b^{14}c^0 + 496a^{15}b^{15}c^9 \\
& - 88a^{16}b^{16}c^8 - 416a^{17}b^{17}c^7 + 770a^{18}b^{18}c^6 - 723a^{19}b^{19}c^5 + 7 \\
& 79a^{20}b^{20}c^4 - 732a^{21}b^{21}c^3 + 80a^{22}b^{22}c^2 + 112a^{23}b^{23}c^1 - 8a^{24}b^{24}c^0 \\
& + 180a^{25}b^{25}c^9 - 494a^{26}b^{26}c^8 + 521a^{27}b^{27}c^7 + 572a^{28}b^{28}c^6 - 424a^{29}b^{29}c^5 \\
& + 56a^{30}b^{30}c^4 + 8a^{31}b^{31}c^3 + 234a^{32}b^{32}c^2 - 1152a^{33}b^{33}c^1 + 416a^{34}b^{34}c^0 \\
& - 140a^{35}b^{35}c^9 - 72a^{36}b^{36}c^8 + 64a^{37}b^{37}c^7 + 220a^{38}b^{38}c^6 - 256a^{39}b^{39}c^5 \\
& - 24a^{40}b^{40}c^4 + 136a^{41}b^{41}c^3 - 100a^{42}b^{42}c^2)) / c^8 + (((2048(16a^3c^{13} - 32a^4c^{12} \\
& + 176a^5c^{11} + 48a^6c^{10} - 2b^4c^{12} + 6b^5c^{11} - 18b^6c^{10} + 26b^7c^9 - \\
& 12b^8c^8 + 16a^2b^2c^{13} - 40a^3b^3c^{12} + 122a^4b^4c^{11} - 192a^5b^5c^{10} \\
& - 74a^6b^6c^9 + 20a^7b^7c^8 + 64a^8b^8c^7 - 144a^9b^9c^6 - 352a^{10}b^{10}c^5 \\
& - 144a^{11}b^{11}c^4 - 204a^{12}b^{12}c^3 + 388a^{13}b^{13}c^2 - 50a^{14}b^{14}c^1 - 182a^{15}b^{15}c^0 \\
& + 4a^{16}b^{16}c^9 - 260a^{17}b^{17}c^8 + 496a^{18}b^{18}c^7 - 260a^{19}b^{19}c^6 + 496a^{20}b^{20}c^5 \\
& - 10a^{21}b^{21}c^4 - 20a^{22}b^{22}c^3 - 148a^{23}b^{23}c^2 + 116a^{24}b^{24}c^1 + 8a^{25}b^{25}c^0 \\
& - 44a^{26}b^{26}c^9 + 8a^{27}b^{27}c^8 - 44a^{28}b^{28}c^7)) / c^8 + (1024 \tan(x/2) (b^2 * 2i - a * c * 2i + c^2 * 1i) \\
& * (32a^8c^{16} - 64a^9c^{15} - 128a^{10}c^{14} + 64a^{11}c^{13} + 96a^{12}c^{12} - \\
& 8b^2c^{15} + 24b^3c^{14} - 32b^4c^{13} + 32b^5c^{12} - 24b^6c^{11} + 8b^7c^{10} \\
& + 144a^2b^2c^{14} - 200a^3b^3c^{13} + 184a^4b^4c^{12} - 56a^5b^5c^{11} - \\
& 8a^6b^6c^{10} + 288a^7b^7c^9 + 352a^8b^8c^8 - 32a^9b^9c^7 - 320a^{10}b^{10}c^6 \\
& + 8a^{11}b^{11}c^5 + 96a^{12}b^{12}c^4 - 8a^{13}b^{13}c^3 - 272a^{14}b^{14}c^2 + 40a^{15}b^{15}c^1 \\
& + 8a^{16}b^{16}c^0 - 56a^{17}b^{17}c^9 - 96a^{18}b^{18}c^8)) / c^11 * (b^2 * 2i - a * c * 2i + c^2 * 1i) \\
& / (2c^3) * (b^2 * 2i - a * c * 2i + c^2 * 1i) / (2c^3) * (b^2 * 2i - a * c * 2i + c^2 * 1i) / (2c^3) \\
& * (b^2 * 2i - a * c * 2i + c^2 * 1i) / (2c^3) * (b^2 * 2i - a * c * 2i + c^2 * 1i) / (2c^3) \\
& * (b^2 * 2i - a * c * 2i + c^2 * 1i) / c^3
\end{aligned}$$

**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
```

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

**Optimal.** Leaf size=299

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

[Out]  $-\frac{b^3 x}{c^2} + \frac{\sin(x)}{c} + 2 \arctan\left(\frac{(b-2c - (-4ac+b^2)^{1/2})^{1/2} \tan(x/2)}{(b+2c - (-4ac+b^2)^{1/2})^{1/2}}\right) + \frac{(b^2 - ac - b^3/(-4ac+b^2)^{1/2} + 3abc/(-4ac+b^2)^{1/2})}{c^2} \frac{\tan^{-1}\left(\frac{\tan(x/2)\sqrt{-\sqrt{b^2-4ac}+b-2c}}{\sqrt{-\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{-\sqrt{b^2-4ac}+b-2c}\sqrt{-\sqrt{b^2-4ac}+b+2c}} + 2 \arctan\left(\frac{(b-2c + (-4ac+b^2)^{1/2})^{1/2} \tan(x/2)}{(b+2c + (-4ac+b^2)^{1/2})^{1/2}}\right) + \frac{(b^2 - ac + b^3/(-4ac+b^2)^{1/2} - 3abc/(-4ac+b^2)^{1/2})}{c^2} \frac{\tan^{-1}\left(\frac{\tan(x/2)\sqrt{\sqrt{b^2-4ac}+b-2c}}{\sqrt{\sqrt{b^2-4ac}+b+2c}}\right)}{\sqrt{\sqrt{b^2-4ac}+b-2c}\sqrt{\sqrt{b^2-4ac}+b+2c}}$

**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}

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

Antiderivative was successfully verified.

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

[Out]  $-\frac{(b^3 x)/c^2}{c^2} + \frac{2(b^2 - ac - b^3/\text{Sqrt}[b^2 - 4ac] + (3abc)/\text{Sqrt}[b^2 - 4ac]) \text{ArcTan}[\frac{\text{Sqrt}[b - 2c - \text{Sqrt}[b^2 - 4ac]] \text{Tan}[x/2]}{\text{Sqrt}[b + 2c - \text{Sqrt}[b^2 - 4ac]]}]}{c^2 \text{Sqrt}[b - 2c - \text{Sqrt}[b^2 - 4ac]] \text{Sqrt}[b + 2c - \text{Sqrt}[b^2 - 4ac]]} + \frac{2(b^2 - ac + b^3/\text{Sqrt}[b^2 - 4ac] - (3abc)/\text{Sqrt}[b^2 - 4ac]) \text{ArcTan}[\frac{\text{Sqrt}[b - 2c + \text{Sqrt}[b^2 - 4ac]] \text{Tan}[x/2]}{\text{Sqrt}[b + 2c + \text{Sqrt}[b^2 - 4ac]]}]}{c^2 \text{Sqrt}[b - 2c + \text{Sqrt}[b^2 - 4ac]] \text{Sqrt}[b + 2c + \text{Sqrt}[b^2 - 4ac]]} + \frac{\sin(x)}{c}$

**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

$$\begin{aligned} \int \frac{\cos^3(x)}{a + b \cos(x) + c \cos^2(x)} dx &= \int \left( -\frac{b}{c^2} + \frac{\cos(x)}{c} + \frac{ab + b^2 \left(1 - \frac{ac}{b^2}\right) \cos(x)}{c^2 (a + b \cos(x) + c \cos^2(x))} \right) dx \\ &= -\frac{bx}{c^2} + \frac{\int \frac{ab + b^2 \left(1 - \frac{ac}{b^2}\right) \cos(x)}{a + b \cos(x) + c \cos^2(x)} dx}{c^2} + \frac{\int \cos(x) dx}{c} \\ &= -\frac{bx}{c^2} + \frac{\sin(x)}{c} + \frac{\left(b^2 - ac + \frac{b^3}{\sqrt{b^2 - 4ac}} - \frac{3abc}{\sqrt{b^2 - 4ac}}\right) \int \frac{1}{b + \sqrt{b^2 - 4ac} + 2c \cos(x)} dx}{c^2} + \frac{(b^2 - ac)}{c^2} \\ &= -\frac{bx}{c^2} + \frac{\sin(x)}{c} + \frac{\left(2 \left(b^2 - ac + \frac{b^3}{\sqrt{b^2 - 4ac}} - \frac{3abc}{\sqrt{b^2 - 4ac}}\right)\right) \text{Subst}\left(\int \frac{1}{b + 2c + \sqrt{b^2 - 4ac} + (b - 2c) \cos(x)} dx\right)}{c^2} \\ &= -\frac{bx}{c^2} + \frac{\sin(x)}{c} + \frac{2 \left(b^2 - ac - \frac{b^3}{\sqrt{b^2 - 4ac}} + \frac{3abc}{\sqrt{b^2 - 4ac}}\right) \tan^{-1}\left(\frac{\sqrt{b - 2c - \sqrt{b^2 - 4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b + 2c - \sqrt{b^2 - 4ac}}}\right)}{c^2 \sqrt{b - 2c - \sqrt{b^2 - 4ac}} \sqrt{b + 2c - \sqrt{b^2 - 4ac}}} + \frac{2(b^2 - ac)}{c^2} \end{aligned}$$

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

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

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]  $\frac{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 + \frac{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^{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 - \frac{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)$

$$\begin{aligned}
& ) * c^4) * \text{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)) + \text{sqrt}(2) * c^2 * \text{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) * \text{sq} \\
& \text{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) * \text{sqrt}(-(a^4 * b^6 - 2 * a^2 * b^8 + b^{10} + 9 * a^4 * b^2 * c^4 + 12 * \\
& (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 * \text{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) * \text{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)) * \text{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) * \text{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)) - \text{sqrt}(2) * c^2 * \\
& \text{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) * \text{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) * \text{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 * \text{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) * \text{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) *
\end{aligned}$$

$$4)c^{10} + 4(a^5 - 3a^3b^2 + 2ab^4)c^9 - (a^4b^2 - 2a^2b^4 + b^6)c^8) \sin(x) + (12a^4b^2c^5 + (20a^5b - 31a^3b^3)c^4 + (8a^6b - 33a^4b^3 + 27a^2b^5)c^3 - 3(2a^5b^3 - 5a^3b^5 + 3ab^7)c^2 + (a^4b^5 - 2a^2b^7 + b^9)c) \sin(x) \sqrt{(a^2b^4 - b^6 + 2a^3c^3 + (2a^4 - 9a^2b^2)c^2 - 2(2a^3b^2 - 3ab^4)c - (4ac^7 + (8a^2 - b^2)c^6 + 2(2a^3 - 3ab^2)c^5 - (a^2b^2 - b^4)c^4) \sqrt{-(a^4b^6 - 2a^2b^8 + b^{10} + 9a^4b^2c^4 + 12(a^5b^2 - 2a^3b^4)c^3 + 2(2a^6b^2 - 11a^4b^4 + 11a^2b^6)c^2 - 4(a^5b^4 - 3a^3b^6 + 2ab^8)c}) / (4ac^{13} + (16a^2 - b^2)c^{12} + 12(2a^3 - ab^2)c^{11} + 2(8a^4 - 11a^2b^2 + b^4)c^{10} + 4(a^5 - 3a^3b^2 + 2ab^4)c^9 - (a^4b^2 - 2a^2b^4 + b^6)c^8))} / (4ac^7 + (8a^2 - b^2)c^6 + 2(2a^3 - 3ab^2)c^5 - (a^2b^2 - b^4)c^4) + (a^5b^4 - a^3b^6 - 3a^5b^2c^2 - 2(a^6b^2 - 2a^4b^4)c) \cos(x) - 4bx + 4c \sin(x) / c^2$$

**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]  $\frac{1}{c^2} \frac{(-4ac+b^2)^{1/2}}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{rctanh}((-a+b-c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \frac{b^4-1/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}((a-b+c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \frac{b^4+5/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}((-a+b-c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \frac{a^2-2/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}((-a+b-c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \frac{a^2b^3-5/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}((a-b+c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \frac{a^2+2/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}((a-b+c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \frac{a^2b^3+1/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}((-a+b-c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \frac{a^2b^2+1/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}((-a+b-c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \frac{a^2b^2+1/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}((a-b+c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \frac{a^2b^3+1/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}((-a+b-c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \frac{a^2b^2+1/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}((a-b+c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \frac{a^2b^3+1/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}((-a+b-c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \frac{a^2b^3-2/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}((a-b+c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \frac{a^2b^2+1/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}((-a+b-c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \frac{a^2b^2-2/c^2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}((a-b+c)\tan(1/2x))}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}$

$$\begin{aligned} & ) * \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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{arctanh}((-a+b-c)*\tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}-a+c)*(a- \\ & b+c))^{(1/2)}) * b^3 \end{aligned}$$

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

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

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] 
$$\begin{aligned} & -(c^2*\operatorname{integrate}(-2*(2*(b^3 - a*b*c)*\cos(3*x))^2 + 4*(2*a^2*b + a*b*c)*\cos(2* \\ & x)^2 + 2*(b^3 - a*b*c)*\cos(x)^2 + 2*(b^3 - a*b*c)*\sin(3*x)^2 + 4*(2*a^2*b + \\ & a*b*c)*\sin(2*x)^2 + 2*(4*a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*\sin(2*x)*\sin(x) \\ & + 2*(b^3 - a*b*c)*\sin(x)^2 + (2*a*b*c*\cos(2*x) + (b^2*c - a*c^2)*\cos(3*x) + \\ & (b^2*c - a*c^2)*\cos(x))*\cos(4*x) + (b^2*c - a*c^2 + 2*(4*a*b^2 - a*c^2 - ( \\ & 2*a^2 - b^2)*c)*\cos(2*x) + 4*(b^3 - a*b*c)*\cos(x))*\cos(3*x) + 2*(a*b*c + (4 \\ & *a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*\cos(x))*\cos(2*x) + (b^2*c - a*c^2)*\cos(x) \\ & + (2*a*b*c*\sin(2*x) + (b^2*c - a*c^2)*\sin(3*x) + (b^2*c - a*c^2)*\sin(x))*\sin \\ & (4*x) + 2*((4*a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*\sin(2*x) + 2*(b^3 - a*b*c) \\ & )*\sin(x))*\sin(3*x) / (c^4*\cos(4*x)^2 + 4*b^2*c^2*\cos(3*x)^2 + 4*b^2*c^2*\cos(x) \\ & )^2 + c^4*\sin(4*x)^2 + 4*b^2*c^2*\sin(3*x)^2 + 4*b^2*c^2*\sin(x)^2 + 4*b*c^3* \\ & \cos(x) + c^4 + 4*(4*a^2*c^2 + 4*a*c^3 + c^4)*\cos(2*x)^2 + 4*(4*a^2*c^2 + 4* \\ & a*c^3 + c^4)*\sin(2*x)^2 + 8*(2*a*b*c^2 + b*c^3)*\sin(2*x)*\sin(x) + 2*(2*b*c^ \\ & 3*\cos(3*x) + 2*b*c^3*\cos(x) + c^4 + 2*(2*a*c^3 + c^4)*\cos(2*x))*\cos(4*x) + \\ & 4*(2*b^2*c^2*\cos(x) + b*c^3 + 2*(2*a*b*c^2 + b*c^3)*\cos(2*x))*\cos(3*x) + 4* \\ & (2*a*c^3 + c^4 + 2*(2*a*b*c^2 + b*c^3)*\cos(x))*\cos(2*x) + 4*(b*c^3*\sin(3*x) \\ & + b*c^3*\sin(x) + (2*a*c^3 + c^4)*\sin(2*x))*\sin(4*x) + 8*(b^2*c^2*\sin(x) + \\ & (2*a*b*c^2 + b*c^3)*\sin(2*x))*\sin(3*x)), x) + b*x - c*\sin(x) / c^2 \end{aligned}$$

**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]  $\text{int}(\cos(x)^3/(a + b\cos(x) + c\cos(x)^2), x)$

[Out]  $\sin(x)/c - \text{atan}\left(\frac{\left(\left(\left(\left(8192(4a^2c^{10} - 4a^3c^9 - 20a^4c^8 - 12a^5c^7 + b^4c^8 - 5b^5c^7 + 7b^6c^6 - 3b^7c^5 - 5ab^2c^9 + 31ab^3c^8 - 46ab^4c^7 + 15ab^5c^6 + 5ab^6c^5 - 44a^2b^2c^9 - 64a^3b^3c^8 - 28a^4b^4c^7 - 8a^5b^5c^6 + 73a^2b^2c^8 + 4a^2b^3c^7 - 40a^2b^4c^6 + a^2b^5c^5 + 85a^3b^2c^7 + 3a^3b^3c^6 - 5a^3b^4c^5 + 23a^4b^2c^6 + 2a^4b^3c^5)\right)\right)\right)/c^4 - (8192\tan(x/2)\left((b^8 - a^2b^6 + 8a^4c^4 + 8a^5c^3 + b^5(-4ac - b^2)^3\right)^{1/2} + 8a^3b^4c - a^2b^3(-4ac - b^2)^3\right)^{1/2} + 33a^2b^4c^2 - 38a^3b^2c^3 - 18a^4b^2c^2 - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3\right)^{1/2} - 4ab^3c(-4ac - b^2)^3\right)^{1/2} + 2a^3b^2c(-4ac - b^2)^3\right)^{1/2}}{2(16a^2c^8 + 32a^3c^7 + 16a^4c^6 + b^4c^6 - b^6c^4 - 8ab^2c^7 + 10ab^4c^5 - 32a^2b^2c^6 + a^2b^4c^4 - 8a^3b^2c^5))^{1/2}}\left(8a^2c^{12} - 16a^2c^{11} - 32a^3c^{10} + 16a^4c^9 + 24a^5c^8 - 2b^2c^{11} + 6b^3c^{10} - 8b^4c^9 + 8b^5c^8 - 6b^6c^7 + 2b^7c^6 + 36ab^2c^{10} - 50ab^3c^9 + 46ab^4c^8 - 14ab^5c^7 - 2ab^6c^6 + 72a^2b^2c^{10} + 88a^3b^2c^9 - 8a^4b^2c^8 - 80a^2b^2c^9 + 2a^2b^3c^8 + 24a^2b^4c^7 - 2a^2b^5c^6 - 68a^3b^2c^8 + 10a^3b^3c^7 + 2a^3b^4c^6 - 14a^4b^2c^7 - 24ab^2c^{11}\right)/c^4\left((b^8 - a^2b^6 + 8a^4c^4 + 8a^5c^3 + b^5(-4ac - b^2)^3\right)^{1/2} + 8a^3b^4c - a^2b^3(-4ac - b^2)^3\right)^{1/2} + 33a^2b^4c^2 - 38a^3b^2c^3 - 18a^4b^2c^2 - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3\right)^{1/2} - 4ab^3c(-4ac - b^2)^3\right)^{1/2} + 2a^3b^2c(-4ac - b^2)^3\right)^{1/2}}{2(16a^2c^8 + 32a^3c^7 + 16a^4c^6 + b^4c^6 - b^6c^4 - 8ab^2c^7 + 10ab^4c^5 - 32a^2b^2c^6 + a^2b^4c^4 - 8a^3b^2c^5))^{1/2}} + (8192\tan(x/2)\left(2a^3c^8 - 2a^4c^7 + 6a^5c^6 + 10a^6c^5 + 2b^4c^7 - 6b^5c^6 + 8b^6c^5 - 8b^7c^4 + 6b^8c^3 - 2b^9c^2 - 8ab^2c^8 + 24ab^3c^7 - 38ab^4c^6 + 56ab^5c^5 - 50ab^6c^4 + 14ab^7c^3 + 2ab^8c^2 + 18a^3b^2c^7 + 12a^4b^2c^6 - 22a^5b^2c^5 + 23a^2b^2c^7 - 99a^2b^3c^6 + 93a^2b^4c^5 + 7a^2b^5c^4 - 24a^2b^6c^3 + 2a^2b^7c^2 + 37a^3b^2c^6 - 122a^3b^3c^5 + 59a^3b^4c^4 - 10a^3b^5c^3 - 2a^3b^6c^2 + 11a^4b^2c^5 + 15a^4b^3c^4 + 14a^4b^4c^3 - 27a^5b^2c^4\right)/c^4\left((b^8 - a^2b^6 + 8a^4c^4 + 8a^5c^3 + b^5(-4ac - b^2)^3\right)^{1/2} + 8a^3b^4c - a^2b^3(-4ac - b^2)^3\right)^{1/2} + 33a^2b^4c^2 - 38a^3b^2c^3 - 18a^4b^2c^2 - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3\right)^{1/2} - 4ab^3c(-4ac - b^2)^3\right)^{1/2} + 2a^3b^2c(-4ac - b^2)^3\right)^{1/2}}{2(16a^2c^8 + 32a^3c^7 + 16a^4c^6 + b^4c^6 - b^6c^4 - 8ab^2c^7 + 10ab^4c^5 - 32a^2b^2c^6 + a^2b^4c^4 - 8a^3b^2c^5))^{1/2}} + (8192(2a^5c^5 - a^4c^6 - 3b^9c + 3a^6c^4 + b^6c^4 - 4b^7c^3 + 6b^8c^2 - 5ab^4c^5 + 23ab^5c^4 - 38ab^6c^3 + 16ab^7c^2 + a^2b^7c - 5a^3b^6c + 6a^4b^5c + 2a^4b^5c + 10a^5b^4c + 8a^6b^3c + 4a^2b^2c^6 - 28a^2b^3c^5 + 57a^2b^4c^4 - 3a^2b^5c^3 - 41a^2b^6c^2 - 3a^3b^2c^5 - 55a^3b^3c^4 + 91a^3b^4c^3 + 4a^3b^5c^2 - 24a^4b^2c^4 - 36a^4b^3c^3 + 25a^4b^4c^2 - 20a^5b^2c^3 - 10a^5b^3c^2 + 5ab^8c))/c^4\left((b^8 - a^2b^6 + 8a^4c^4 + 8a^5c^3 + b^5(-4ac - b^2)^3\right)^{1/2} + 8a^3b^4c - a^2b^3(-4ac - b^2)^3\right)^{1/2} + 33a^2b^4c^2 - 38a^3b^2c^3 - 18a^4b^2c^2 - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3\right)^{1/2} - 4ab^3c(-4ac - b^2)^3\right)^{1/2} + 2a^3b^2c(-4ac - b^2)^3\right)^{1/2}}{2(16a^2c^8 + 32a^3c^7 + 16a^4c^6 + b^4c^6 - b^6c^4 - 8ab^2c^7 + 10ab^4c^5 - 32a^2b^2c^6 + a^2b^4c^4 - 8a^3b^2c^5))^{1/2}} - (8192\tan(x/2)\left(5ab^8 + b^8c - b^9 - 10a^2b^7 + 10a^3b^6 - 5a^4b^5 + a^5b^4 + a^6c^3 + a^7c^2 - 6ab^6c^2 - 20a^2b^6c + 40a^3b^5c - 35a^4b^4c + 14a^5b^3c - a^6b^2c - 2a^6b^2c + 9a^2b^4c^3 + 11a^2b^5c^2 - 2a^3b^2c^4 - 18a^3b^3c^3 + 5a^3b^4c^2 + 10a^4b^2c^3 - 20a^4b^3c^2 + 10a^5b^2c^2 + 2ab^7c\right)/c^4\left((b^8 - a^2b^6 + 8a^4c^4 + 8a^5c^3 + b^5(-4ac - b^2)^3\right)^{1/2} + 8a^3b^4c - a^2b^3(-4ac - b^2)^3\right)^{1/2} + 33a^2b^4c^2 - 38a^3b^2c^3 - 18a^4b^2c^2 - 10ab^6c + 3a^2b^2c^2(-4ac - b^2)^3\right)^{1/2} - 4ab^3c(-4ac - b^2)^3\right)^{1/2} + 2a^3b^2c(-4ac - b^2)^3\right)^{1/2}}{2(16a^2c^8 + 32a^3c^7 + 16a^4c^6 + b^4c^6 - b^6c^4 - 8ab^2c^7 + 10ab^4c^5 - 32a^2b^2c^6 + a^2b^4c^4 - 8a^3b^2c^5))^{1/2}}$

$$\begin{aligned}
& 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)}*i - (((((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 \\
& *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*(
\end{aligned}$$

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





$$\begin{aligned}
& 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 - \operatorname{atan}(\frac{(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 \\
& 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
\end{aligned}$$

$$\begin{aligned}
& *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)}*i - (((((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 +
\end{aligned}$$



$$\begin{aligned}
& \left( a^6 + a^2 b^4 c^4 - 8 a^3 b^2 c^5 \right)^{1/2} - (8192 \tan(x/2) (5 a^8 b + 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} + 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 \\
& 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 \\
& 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 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 \\
& 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^8 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 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 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 \\
& 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 \\
& 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
\end{aligned}$$

$$\begin{aligned}
& c^6 + a^2 b^4 c^4 - 8 a^3 b^2 c^5) )^{1/2} + (8192 \tan(x/2) * (5 a^8 b + 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^6 b^2 c - 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^2 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^6 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^2 c - b^2)^3)^{1/2} + 8 a^3 b^4 c + a^2 b^3 * (-4 a^2 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^6 b^2 c - 3 a^2 b^2 c^2 \\
& * (-4 a^2 c - b^2)^3)^{1/2} + 4 a^2 b^3 c * (-4 a^2 c - b^2)^3)^{1/2} - 2 a^3 b^2 c * \\
& (-4 a^2 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^2 b^2 c^7 + 10 a^2 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^2 c) ) / \\
& c^4) * ((b^8 - a^2 b^6 + 8 a^4 c^4 + 8 a^5 c^3 - b^5 * (-4 a^2 c - b^2)^3)^{1/2} \\
& ) + 8 a^3 b^4 c + a^2 b^3 * (-4 a^2 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^6 b^2 c - 3 a^2 b^2 c^2 * (-4 a^2 c - b^2)^3)^{1/2} \\
& + 4 a^2 b^3 c * (-4 a^2 c - b^2)^3)^{1/2} - 2 a^3 b^2 c * (-4 a^2 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^2 b^2 * \\
& c^7 + 10 a^2 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 * \operatorname{atan}(((b * ((8192 * \tan(x/2) * (5 a^8 b + 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^6 b^2 c - 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^2 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^6 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^2 b^4 c^5 + 23 a^2 b^5 c^4 - 38 a^2 b^6 c^3 + 16 a^2 b^7 c^2 \\
& + a^2 b^7 c - 5 a^3 b^6 c + 6 a^4 b^5 c + 2 a^4 b^5 c + 10 a^5 b^6 c^4 + 8 a^ \\
& 6 b^6 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^6 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^2 b^2 c^9 + 31 a^2 b^3 c^8 - 46 a^2 b^4 c^7 + 15 a^2 b^5 c^6 + 5 a^2 b^6 c^5 - 44 * \\
& a^2 b^6 c^9 - 64 a^3 b^6 c^8 - 28 a^4 b^6 c^7 - 8 a^5 b^6 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^2 b^2 c^{10} - \\
& 50 a^2 b^3 c^9 + 46 a^2 b^4 c^8 - 14 a^2 b^5 c^7 - 2 a^2 b^6 c^6 + 72 a^2 b^6 c^{10} + \\
& 88 a^3 b^6 c^9 - 8 a^4 b^6 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^4 b^3 c^6) * 8192 i) / c^6) * i) / 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^2 b^2 c^8 + 24 a^2 b^3 c^7 - 38 a^2 b^4 c^ \\
& 6 + 56 a^2 b^5 c^5 - 50 a^2 b^6 c^4 + 14 a^2 b^7 c^3 + 2 a^2 b^8 c^2 + 18 a^3 b^2 c^7 \\
& + 12 a^4 b^2 c^6 - 22 a^5 b^2 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) * i) / c^2) * \\
& i) / c^2 + (b * ((8192 * \tan(x/2) * (5 a^8 b + 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^6 b^2 c - 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^2 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^6 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^2 b^4 c^5 + 23 a^2 b^5 c^4 - 38 a^2 b^6 c^3 + 16 a^2 b^7 c^2 \\
& + a^2 b^7 c - 5 a^3 b^6 c + 6 a^4 b^5 c + 2 a^4 b^5 c + 10 a^5 b^6 c^4 + 8 a^ \\
& 6 b^6 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^
\end{aligned}$$

$$\begin{aligned}
& ^5c^2 - 24a^4b^2c^4 - 36a^4b^3c^3 + 25a^4b^4c^2 - 20a^5b^2c^3 \\
& - 10a^5b^3c^2 + 5a^5b^8c)) / c^4 + (b((b((8192(4a^2c^{10} - 4a^3c^9 \\
& - 20a^4c^8 - 12a^5c^7 + b^4c^8 - 5b^5c^7 + 7b^6c^6 - 3b^7c^5 - 5 \\
& *a*b^2c^9 + 31*a*b^3c^8 - 46*a*b^4c^7 + 15*a*b^5c^6 + 5*a*b^6c^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*(4a^2c^{10} - 4a^3c^9 - 20a^4c^8 - 12* \\
& a^5c^7 + b^4c^8 - 5b^5c^7 + 7b^6c^6 - 3b^7c^5 - 5a*b^2c^9 + 31*a* \\
& b^3c^8 - 46*a*b^4c^7 + 15*a*b^5c^6 + 5*a*b^6c^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)*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
\end{aligned}$$

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

**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



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

**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]  $x/c - 2 \arctan\left(\frac{(b-2c - (-4ac+b^2)^{1/2})^{1/2} \tan(x/2)}{(b+2c - (-4ac+b^2)^{1/2})^{1/2}}\right) + \frac{(b+2c - (-4ac+b^2)^{1/2})^{1/2} \tan(x/2)}{(b+2c - (-4ac+b^2)^{1/2})^{1/2} - 2 \arctan\left(\frac{(b-2c - (-4ac+b^2)^{1/2})^{1/2} \tan(x/2)}{(b+2c - (-4ac+b^2)^{1/2})^{1/2}}\right) + \frac{(b+2c - (-4ac+b^2)^{1/2})^{1/2} \tan(x/2)}{(b+2c - (-4ac+b^2)^{1/2})^{1/2}}\right) + \frac{x}{c}$

**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]  $x/c - \frac{2(b - (b^2 - 2ac)/\sqrt{b^2 - 4ac}) \operatorname{ArcTan}[(\sqrt{b - 2c - \sqrt{b^2 - 4ac}}) \operatorname{Tan}[x/2]]/\sqrt{b + 2c - \sqrt{b^2 - 4ac}}]}{c \sqrt{b - 2c - \sqrt{b^2 - 4ac}} \sqrt{b + 2c - \sqrt{b^2 - 4ac}}} - \frac{2(b + (b^2 - 2ac)/\sqrt{b^2 - 4ac}) \operatorname{ArcTan}[(\sqrt{b - 2c + \sqrt{b^2 - 4ac}}) \operatorname{Tan}[x/2]]/\sqrt{b + 2c + \sqrt{b^2 - 4ac}}]}{c \sqrt{b - 2c + \sqrt{b^2 - 4ac}} \sqrt{b + 2c + \sqrt{b^2 - 4ac}}}$

**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[ExpandTrig[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] && IntegersQ[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

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

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

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

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]]) - (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]]))/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 +
```



$$\begin{aligned}
& 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) - 4*x)/c
\end{aligned}$$

**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\*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 - 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

$$\begin{aligned}
& \sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )a^2bc^2 - 32(b^2 - 4ac)a^2bc^2 + 19\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )ab^2c^2 + 14(b^2 - 4ac)ab^2c^2 + 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )b^3c^2 + 2(b^2 - 4ac)b^3c^2 + 20\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )a^2c^3 + 8(b^2 - 4ac)a^2c^3 - 20\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )ab^3c^3 - 8(b^2 - 4ac)ab^3c^3)c^2\text{abs}(a - b + c) + (4a^3b^4c - 4a^2b^5c - 4ab^6c + 4b^7c - 32a^4b^2c^2 \\
& + 32a^3b^3c^2 + 40a^2b^4c^2 - 32ab^5c^2 - 8b^6c^2 + 64a^5c^3 - 64a^4b^3c^3 - 128a^3b^2c^3 \\
& + 64a^2b^3c^3 + 68ab^4c^3 + 4b^5c^3 + 128a^4c^4 - 160a^2b^2c^4 - 32ab^3c^4 + 64a^3c^5 + 64a^2b^3c^5 \\
& - 3\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)a^4b^2c + 2\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )a^3b^3c + 8\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)a^2b^4c - 2\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )ab^5c - 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)b^6c + 12\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )a^5c^2 - 8\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)a^4b^2c^2 - 49\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )a^3b^2c^2 + \sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)a^2b^3c^2 + 41\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )ab^4c^2 + 11\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)b^5c^2 + 68\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )a^4c^3 + 28\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)a^3b^3c^3 - 93\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )a^2b^2c^3 - 64\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)ab^3c^3 - 11\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )b^4c^3 + 36\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)a^3c^4 + 80\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )a^2b^3c^4 + 49\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)ab^2c^4 + 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )b^3c^4 - 20\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c)a^2c^5 - 20\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )ab^3c^5 - 4(b^2 - 4ac)a^3b^2c + 4(b^2 - 4ac)a^2b^3c + 4(b^2 - 4ac)ab^4c - 4(b^2 - 4ac) \\
& )b^5c + 16(b^2 - 4ac)a^4c^2 - 16(b^2 - 4ac)a^3b^2c^2 - 24(b^2 - 4ac)a^2b^2c^2 + 16(b^2 - 4ac)ab^3c^2 + 8(b^2 - 4ac)b^4c^2 + \\
& 32(b^2 - 4ac)a^3c^3 - 36(b^2 - 4ac)ab^2c^3 - 4(b^2 - 4ac)b^3c^3 + 16(b^2 - 4ac)a^2c^4 + 16(b^2 - 4ac)ab^3c^4) \\
& )\text{abs}(a - b + c)\text{abs}(c) + (2a^4b^3c^2 - 6a^3b^4c^2 + 6a^2b^5c^2 - 2ab^6c^2 - 8a^5b^3c^3 + 28a^4b^2c^3 - 30a^3b^3c^3 \\
& + 10a^2b^4c^3 - 2ab^5c^3 + 2b^6c^3 - 16a^5c^4 + 24a^4b^3c^4 - 4a^3b^2c^4 + 6a^2b^3c^4 - 6ab^4c^4 - 4b^5c^4 - 16a^4c^5 \\
& + 8a^3b^3c^5 - 12a^2b^2c^5 + 22ab^3c^5 + 2b^4c^5 + 16a^3c^6 - 24a^2b^2c^6 - 12ab^2c^6 + 16a^2c^7 + 3\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \\
& )\sqrt{b^2 - 4ac}a^4b^2c^2 - 2(b^2 - 4ac)a^4b^2c^2 - 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )a^3b^2c^2 + 6(b^2 - 4ac)a^3b^2c^2 - 3\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )a^2b^3c^2 - 6(b^2 - 4ac)a^2b^3c^2 + 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )ab^4c^2 + 2(b^2 - 4ac)ab^4c^2 + 6\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )a^4c^3 - 4(b^2 - 4ac)a^4c^3 + 7\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )a^3b^3c^3 + 6(b^2 - 4ac)a^3b^3c^3 - 13\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )a^2b^2c^3 - 2(b^2 - 4ac)a^2b^2c^3 - 3\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )ab^3c^3 + 2(b^2 - 4ac)ab^3c^3 - 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac} \\
& )b^4c^3 - 2(b^2 - 4ac)b^4c^3 + 22\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c) \sqrt{b^2 - 4ac}
\end{aligned}$$

$$\begin{aligned}
&^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a^3*c^4 - 4*(b^2 - 4*a*c)*a^3*c^4 \\
&- 3*\text{sqrt}(a^2 - a*b + b*c - c^2 - \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - \\
&- 4*a*c)*a^2*b*c^4 + 2*(b^2 - 4*a*c)*a^2*b*c^4 + 23*\text{sqrt}(a^2 - a*b + b*c - \\
&- c^2 - \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a*b^2*c^4 - 2*(b^2 - \\
&- 4*a*c)*a*b^2*c^4 + 6*\text{sqrt}(a^2 - a*b + b*c - c^2 - \text{sqrt}(b^2 - 4*a*c)*(a - b \\
&- + c))*\text{sqrt}(b^2 - 4*a*c)*b^3*c^4 + 4*(b^2 - 4*a*c)*b^3*c^4 - 38*\text{sqrt}(a^2 - \\
&- a*b + b*c - c^2 - \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a^2*c^5 \\
&- + 4*(b^2 - 4*a*c)*a^2*c^5 - 7*\text{sqrt}(a^2 - a*b + b*c - c^2 - \text{sqrt}(b^2 - 4*a*c) \\
&- )*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a*b*c^5 - 6*(b^2 - 4*a*c)*a*b*c^5 - 5*\text{sqrt} \\
&- (a^2 - a*b + b*c - c^2 - \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*b \\
&- ^2*c^5 - 2*(b^2 - 4*a*c)*b^2*c^5 + 10*\text{sqrt}(a^2 - a*b + b*c - c^2 - \text{sqrt}(b^2 \\
&- - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a*c^6 + 4*(b^2 - 4*a*c)*a*c^6)*\text{abs} \\
&- (a - b + c))*(\text{pi}*\text{floor}(1/2*x/\text{pi} + 1/2) + \text{arctan}(2*\text{sqrt}(1/2)*\text{tan}(1/2*x)/\text{sqrt} \\
&- ((2*a*c - 2*c^2 + \text{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 \\
&- 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 \\
&- 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)*\text{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*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - \\
&- 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a^3*b^2 - 2*(b^2 - 4*a*c)*a^3*b^2 - 5 \\
&- *\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a \\
&- *c)*a^2*b^3 + 6*(b^2 - 4*a*c)*a^2*b^3 - 3*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt} \\
&- (b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a*b^4 - 6*(b^2 - 4*a*c)*a*b^4 \\
&- + 5*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - \\
&- 4*a*c)*b^5 + 2*(b^2 - 4*a*c)*b^5 - 12*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 \\
&- - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a^4*c + 8*(b^2 - 4*a*c)*a^4*c + 20 \\
&- *\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a \\
&- *c)*a^3*b*c - 24*(b^2 - 4*a*c)*a^3*b*c + 26*\text{sqrt}(a^2 - a*b + b*c - c^2 + sq \\
&- rt(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a^2*b^2*c + 20*(b^2 - 4*a*c) \\
&- *a^2*b^2*c - 28*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b + c)) \\
&- *\text{sqrt}(b^2 - 4*a*c)*a*b^3*c - 6*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a* \\
&- c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*b^4*c - 4*(b^2 - 4*a*c)*b^4*c - 56*\text{sqrt}(a \\
&- ^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a^3 \\
&- *c^2 + 16*(b^2 - 4*a*c)*a^3*c^2 + 32*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 \\
&- - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a^2*b*c^2 - 32*(b^2 - 4*a*c)*a^2*b* \\
&- c^2 + 19*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b \\
&- ^2 - 4*a*c)*a*b^2*c^2 + 14*(b^2 - 4*a*c)*a*b^2*c^2 + 5*\text{sqrt}(a^2 - a*b + b*c \\
&- - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*b^3*c^2 + 2*(b^2 \\
&- - 4*a*c)*b^3*c^2 + 20*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b \\
&- + c))*\text{sqrt}(b^2 - 4*a*c)*a^2*c^3 + 8*(b^2 - 4*a*c)*a^2*c^3 - 20*\text{sqrt}(a^2 - \\
&- a*b + b*c - c^2 + \text{sqrt}(b^2 - 4*a*c)*(a - b + c))*\text{sqrt}(b^2 - 4*a*c)*a*b*c^3 \\
&- - 8*(b^2 - 4*a*c)*a*b*c^3)*c^2*\text{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*\text{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*\text{sqrt}(a^2 - a*b + b*c - c^2 + sq \\
&- rt(b^2 - 4*a*c)*(a - b + c))*a^3*b^3*c - 8*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt} \\
&- (b^2 - 4*a*c)*(a - b + c))*a^2*b^4*c + 2*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt} \\
&- (b^2 - 4*a*c)*(a - b + c))*a*b^5*c + 5*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 \\
&- - 4*a*c)*(a - b + c))*b^6*c - 12*\text{sqrt}(a^2 - a*b + b*c - c^2 + \text{sqrt}(b^2 - 4
\end{aligned}$$

$$\begin{aligned}
& *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*\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 + \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
\end{aligned}$$

$$*a^6*c^4 + 192*a^5*b*c^4 + 149*a^4*b^2*c^4 - 336*a^3*b^3*c^4 - 30*a^2*b^4*c^4 + 112*a*b^5*c^4 + 17*b^6*c^4 - 276*a^5*c^5 + 320*a^4*b*c^5 + 292*a^3*b^2*c^5 - 224*a^2*b^3*c^5 - 120*a*b^4*c^5 - 304*a^4*c^6 + 128*a^3*b*c^6 + 237*a^2*b^2*c^6 + 24*a*b^3*c^6 - 17*b^4*c^6 - 116*a^3*c^7 - 96*a^2*b*c^7 + 62*a*b^2*c^7 + 16*b^3*c^7 + 24*a^2*c^8 - 64*a*b*c^8 - 5*b^2*c^8 + 20*a*c^9)*abs(c))$$

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))\*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+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+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))\*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





$$\begin{aligned}
& 44a^3b^2)/c + (32768a^2b^4)/c^2 + (32768a^3b^3)/c^2 - (32768a^4b^2) \\
& /c^2 - 131072ab^2c - 262144a^2b^2c) + (49152ab^4 \tan(x/2))/(49152ab \\
& ^4 - 147456a^4b + 540672a^4c + 16384b^4c + 147456a^5 - 16384b^5 + 2 \\
& 29376a^2b^3 - 262144a^3b^2 + 262144a^2c^3 + 655360a^3c^2 - 131072a \\
& *b^2c^2 - 262144a^2b^2c^2 - 360448a^2b^2c - (32768ab^5)/c + (32768a \\
& ^2b^4)/c + (32768a^3b^3)/c - (32768a^4b^2)/c + 131072ab^3c - 393216 \\
& *a^3b^2c) - (147456a^4b \tan(x/2))/(49152ab^4 - 147456a^4b + 540672a^ \\
& 4c + 16384b^4c + 147456a^5 - 16384b^5 + 229376a^2b^3 - 262144a^3b^ \\
& 2 + 262144a^2c^3 + 655360a^3c^2 - 131072ab^2c^2 - 262144a^2b^2c^2 - \\
& 360448a^2b^2c - (32768ab^5)/c + (32768a^2b^4)/c + (32768a^3b^3)/c \\
& - (32768a^4b^2)/c + 131072ab^3c - 393216a^3b^2c) - (32768ab^5 \tan(x/ \\
& 2))/(147456a^5c - 32768ab^5 - 16384b^5c + 32768a^2b^4 + 32768a^3 \\
& *b^3 - 32768a^4b^2 + 262144a^2c^4 + 655360a^3c^3 + 540672a^4c^2 + 1 \\
& 6384b^4c^2 - 131072ab^2c^3 + 131072ab^3c^2 - 262144a^2b^2c^3 + 229 \\
& 376a^2b^3c - 393216a^3b^2c^2 - 262144a^3b^2c - 360448a^2b^2c^2 + \\
& 49152ab^4c - 147456a^4b^2c) + (229376a^2b^3 \tan(x/2))/(49152ab^4 - \\
& 147456a^4b + 540672a^4c + 16384b^4c + 147456a^5 - 16384b^5 + 229376 \\
& *a^2b^3 - 262144a^3b^2 + 262144a^2c^3 + 655360a^3c^2 - 131072ab^2* \\
& c^2 - 262144a^2b^2c^2 - 360448a^2b^2c - (32768ab^5)/c + (32768a^2b^ \\
& 4)/c + (32768a^3b^3)/c - (32768a^4b^2)/c + 131072ab^3c - 393216a^3* \\
& b^2c) - (262144a^3b^2 \tan(x/2))/(49152ab^4 - 147456a^4b + 540672a^4c \\
& + 16384b^4c + 147456a^5 - 16384b^5 + 229376a^2b^3 - 262144a^3b^2 + \\
& 262144a^2c^3 + 655360a^3c^2 - 131072ab^2c^2 - 262144a^2b^2c^2 - 36 \\
& 0448a^2b^2c - (32768ab^5)/c + (32768a^2b^4)/c + (32768a^3b^3)/c - \\
& (32768a^4b^2)/c + 131072ab^3c - 393216a^3b^2c) + (131072ab^3 \tan(x/ \\
& 2))/(131072ab^3 - 393216a^3b + 655360a^3c + 540672a^4 + 16384b^4 - \\
& 360448a^2b^2 + 262144a^2c^2 + (147456a^5)/c - (16384b^5)/c + (49152a \\
& *b^4)/c - (147456a^4b)/c - (32768ab^5)/c^2 + (229376a^2b^3)/c - (2621 \\
& 44a^3b^2)/c + (32768a^2b^4)/c^2 + (32768a^3b^3)/c^2 - (32768a^4b^2) \\
& /c^2 - 131072ab^2c - 262144a^2b^2c) - (393216a^3b \tan(x/2))/(131072a \\
& *b^3 - 393216a^3b + 655360a^3c + 540672a^4 + 16384b^4 - 360448a^2b^ \\
& 2 + 262144a^2c^2 + (147456a^5)/c - (16384b^5)/c + (49152ab^4)/c - (14 \\
& 7456a^4b)/c - (32768ab^5)/c^2 + (229376a^2b^3)/c - (262144a^3b^2)/c \\
& + (32768a^2b^4)/c^2 + (32768a^3b^3)/c^2 - (32768a^4b^2)/c^2 - 131072 \\
& *ab^2c - 262144a^2b^2c) + (655360a^3c \tan(x/2))/(131072ab^3 - 393216 \\
& *a^3b + 655360a^3c + 540672a^4 + 16384b^4 - 360448a^2b^2 + 262144a^ \\
& 2c^2 + (147456a^5)/c - (16384b^5)/c + (49152ab^4)/c - (147456a^4b)/c \\
& - (32768ab^5)/c^2 + (229376a^2b^3)/c - (262144a^3b^2)/c + (32768a^2 \\
& *b^4)/c^2 + (32768a^3b^3)/c^2 - (32768a^4b^2)/c^2 - 131072ab^2c - 26 \\
& 2144a^2b^2c) + (32768a^2b^4 \tan(x/2))/(147456a^5c - 32768ab^5 - 1638 \\
& 4b^5c + 32768a^2b^4 + 32768a^3b^3 - 32768a^4b^2 + 262144a^2c^4 + \\
& 655360a^3c^3 + 540672a^4c^2 + 16384b^4c^2 - 131072ab^2c^3 + 131072 \\
& *ab^3c^2 - 262144a^2b^2c^3 + 229376a^2b^3c - 393216a^3b^2c^2 - 26214 \\
& 4a^3b^2c - 360448a^2b^2c^2 + 49152ab^4c - 147456a^4b^2c) + (32768 \\
& *a^3b^3 \tan(x/2))/(147456a^5c - 32768ab^5 - 16384b^5c + 32768a^2b^ \\
& 4 + 32768a^3b^3 - 32768a^4b^2 + 262144a^2c^4 + 655360a^3c^3 + 54067 \\
& 2a^4c^2 + 16384b^4c^2 - 131072ab^2c^3 + 131072ab^3c^2 - 262144a^ \\
& 2b^2c^3 + 229376a^2b^3c - 393216a^3b^2c - 262144a^3b^2c - 360448a \\
& ^2b^2c^2 + 49152ab^4c - 147456a^4b^2c) - (32768a^4b^2 \tan(x/2))/(14 \\
& 7456a^5c - 32768ab^5 - 16384b^5c + 32768a^2b^4 + 32768a^3b^3 - 32 \\
& 768a^4b^2 + 262144a^2c^4 + 655360a^3c^3 + 540672a^4c^2 + 16384b^4* \\
& c^2 - 131072ab^2c^3 + 131072ab^3c^2 - 262144a^2b^2c^3 + 229376a^2b \\
& ^3c - 393216a^3b^2c^2 - 262144a^3b^2c - 360448a^2b^2c^2 + 49152ab \\
& ^4c - 147456a^4b^2c) - (131072ab^2c \tan(x/2))/(131072ab^3 - 393216a \\
& ^3b + 655360a^3c + 540672a^4 + 16384b^4 - 360448a^2b^2 + 262144a^2* \\
& c^2 + (147456a^5)/c - (16384b^5)/c + (49152ab^4)/c - (147456a^4b)/c - \\
& (32768ab^5)/c^2 + (229376a^2b^3)/c - (262144a^3b^2)/c + (32768a^2b \\
& ^4)/c^2 + (32768a^3b^3)/c^2 - (32768a^4b^2)/c^2 - 131072ab^2c - 2621 \\
& 44a^2b^2c) - (262144a^2b^2c \tan(x/2))/(131072ab^3 - 393216a^3b + 6553
\end{aligned}$$

$$\begin{aligned}
& 60a^3c + 540672a^4 + 16384b^4 - 360448a^2b^2 + 262144a^2c^2 + (147456a^5)/c - (16384b^5)/c + (49152ab^4)/c - (147456a^4b)/c - (32768ab^5)/c^2 + (229376a^2b^3)/c - (262144a^3b^2)/c + (32768a^2b^4)/c^2 + (32768a^3b^3)/c^2 - (32768a^4b^2)/c^2 - 131072ab^2c - 262144a^2b^2c) \\
& ))/c + \operatorname{atan}\left(\frac{\left(\left(-a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3(-4ac - b^2)^3\right)^{1/2} + a^2b(-4ac - b^2)^3\right)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3\right)^{1/2}}{2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)}\right) \cdot \left(\tan\left(\frac{x}{2}\right) \cdot (16384ab^6 - 65536a^2c^6 + 49152b^6c - 16384b^7 + 16384a^2b^5 - 16384a^3b^4 + 245760a^2c^5 + 671744a^3c^4 + 212992a^4c^3 - 147456a^5c^2 + 16384b^2c^5 - 49152b^3c^4 + 65536b^4c^3 - 65536b^5c^2 - 327680ab^2c^4 + 475136ab^3c^3 - 393216ab^4c^2 - 802816a^2b^2c^4 - 180224a^2b^4c - 1081344a^3b^2c^3 - 65536a^3b^3c + 49152a^4b^2c^2 + 98304a^4b^2c + 557056a^2b^2c^3 + 180224a^2b^3c^2 + 344064a^3b^2c^2 + 196608ab^2c^5 + 98304ab^5c) - \left(-a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3(-4ac - b^2)^3\right)^{1/2} + a^2b(-4ac - b^2)^3\right)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3\right)^{1/2}}{2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)}\right) \cdot (8192b^3c^5 - 557056a^3c^5 - 425984a^4c^4 - 98304a^5c^3 - 229376a^2c^6 - 40960b^4c^4 + 57344b^5c^3 - 24576b^6c^2 + 221184ab^2c^5 - 327680ab^3c^4 + 90112ab^4c^3 + 49152ab^5c^2 + 393216a^2b^2c^5 + 622592a^3b^2c^4 + 196608a^4b^2c^3 + \tan\left(\frac{x}{2}\right) \cdot (-a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3(-4ac - b^2)^3)^{1/2} + a^2b(-4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}}{2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)}\right) \cdot (65536a^2c^7 - 262144a^3c^6 + 131072a^4c^5 + 196608a^5c^4 - 16384b^2c^7 + 49152b^3c^6 - 65536b^4c^5 + 65536b^5c^4 - 49152b^6c^3 + 16384b^7c^2 + 294912ab^2c^6 - 409600ab^3c^5 + 376832ab^4c^4 - 114688ab^5c^3 - 16384ab^6c^2 + 589824a^2b^2c^6 + 720896a^3b^2c^5 - 65536a^4b^2c^4 - 655360a^2b^2c^5 + 16384a^2b^3c^4 + 196608a^2b^4c^3 - 16384a^2b^5c^2 - 557056a^3b^2c^4 + 81920a^3b^3c^3 + 16384a^3b^4c^2 - 114688a^4b^2c^3 - 196608ab^2c^7) + 172032a^2b^2c^4 - 352256a^2b^3c^3 + 106496a^3b^2c^3 - 49152a^3b^3c^2 + 24576a^4b^2c^2 - 32768ab^2c^6) \cdot \left(-a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3(-4ac - b^2)^3\right)^{1/2} + a^2b(-4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}}{2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)}\right) - 32768ab^5 + 24576a^5c - 49152b^5c + 24576b^6 - 16384a^2b^4 + 32768a^3b^3 - 8192a^4b^2 + 98304a^2c^4 + 253952a^3c^3 + 180224a^4c^2 - 8192b^3c^3 + 32768b^4c^2 - 155648ab^2c^3 + 262144ab^3c^2 - 270336a^2b^2c^3 + 237568a^2b^3c - 458752a^3b^2c^2 + 24576a^3b^2c + 16384a^2b^2c^2 + 32768ab^2c^4 - 114688ab^4c - 122880a^4b^2c) - \tan\left(\frac{x}{2}\right) \cdot (40960ab^4 - 57344a^4b - 73728a^4c + 8192b^4c + 24576a^5 - 8192b^5 - 81920a^2b^3 + 81920a^3b^2 + 16384a^2c^3 - 81920a^3c^2 - 32768ab^2c^2 + 81920a^2b^2c^2 - 81920a^2b^2c + 163840a^3b^2c) \cdot \left(-a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3(-4ac - b^2)^3\right)^{1/2} + a^2b(-4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}}{2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)}\right) \cdot (24576a^5c - 32768ab^5 - (\tan\left(\frac{x}{2}\right) \cdot (16384ab^6 - 65536a^2c^6 + 49152b^6c - 16384b^7 + 16384a^2b^5 - 16384a^3b^4 + 245760a^2c^5
\end{aligned}$$

$$\begin{aligned}
& *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^
\end{aligned}$$

$$\begin{aligned}
&4c^4 + 57344b^5c^3 - 24576b^6c^2 + 221184ab^2c^5 - 327680a^2b^3c^4 \\
&+ 90112ab^4c^3 + 49152a^2b^5c^2 + 393216a^2b^2c^5 + 622592a^3b^2c^4 \\
&+ 196608a^4b^2c^3 + \tan(x/2)*(-(a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3 \\
&3*(-(4ac - b^2)^3)^{1/2} + a^2b*(-(4ac - b^2)^3)^{1/2} - 6a^3b^2c - \\
&18a^2b^2c^2 + 8ab^4c + 2abc*(-(4ac - b^2)^3)^{1/2})/(2*(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2}*(65536ac^8 - 131072a^2c^7 - 262144a^3c^6 + 131072a^4c^5 + 196608a^5c^4 - 16384b^2c^7 + 49152b^3c^6 - 65536b^4c^5 + 65536b^5c^4 - 49152b^6c^3 + 16384b^7c^2 + 294912ab^2c^6 - 409600ab^3c^5 + 376832ab^4c^4 - 114688ab^5c^3 - 16384ab^6c^2 + 589824a^2b^2c^6 + 720896a^3b^2c^5 - 65536a^4b^2c^4 - 655360a^2b^2c^5 + 16384a^2b^3c^4 + 196608a^2b^4c^3 - 16384a^2b^5c^2 - 557056a^3b^2c^4 + 81920a^3b^3c^3 + 16384a^3b^4c^2 - 114688a^4b^2c^3 - 196608abc^7) + 172032a^2b^2c^4 - 352256a^2b^3c^3 + 106496a^3b^2c^3 - 49152a^3b^3c^2 + 24576a^4b^2c^2 - 32768abc^6))*(-(a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3*(-(4ac - b^2)^3)^{1/2} + a^2b*(-(4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2abc*(-(4ac - b^2)^3)^{1/2})/(2*(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} - 32768ab^5 + 24576a^5c - 49152b^5c + 24576b^6 - 16384a^2b^4 + 32768a^3b^3 - 8192a^4b^2 + 98304a^2c^4 + 253952a^3c^3 + 180224a^4c^2 - 8192b^3c^3 + 32768b^4c^2 - 155648ab^2c^3 + 262144ab^3c^2 - 270336a^2b^2c^3 + 237568a^2b^3c - 458752a^3b^2c^2 + 24576a^3b^2c + 16384a^2b^2c^2 + 32768abc^4 - 114688ab^4c - 122880a^4b^2c) - \tan(x/2)*(40960ab^4 - 57344a^4b - 73728a^4c + 8192b^4c + 24576a^5 - 8192b^5 - 81920a^2b^3 + 81920a^3b^2 + 16384a^2c^3 - 81920a^3c^2 - 32768ab^2c^2 + 81920a^2b^2c^2 - 81920a^2b^2c + 163840a^3b^2c))*(-(a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3*(-(4ac - b^2)^3)^{1/2} + a^2b*(-(4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2abc*(-(4ac - b^2)^3)^{1/2})/(2*(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} + (((-a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3*(-(4ac - b^2)^3)^{1/2} + a^2b*(-(4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2abc*(-(4ac - b^2)^3)^{1/2})/(2*(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2}*(24576a^5c - 32768ab^5 - (\tan(x/2)*(16384ab^6 - 65536ac^6 + 49152b^6c - 16384b^7 + 16384a^2b^5 - 16384a^3b^4 + 245760a^2c^5 + 671744a^3c^4 + 212992a^4c^3 - 147456a^5c^2 + 16384b^2c^5 - 49152b^3c^4 + 65536b^4c^3 - 65536b^5c^2 - 327680ab^2c^4 + 475136ab^3c^3 - 393216ab^4c^2 - 802816a^2b^2c^4 - 180224a^2b^4c - 1081344a^3b^2c^3 - 65536a^3b^3c + 49152a^4b^2c^2 + 98304a^4b^2c + 557056a^2b^2c^3 + 180224a^2b^3c^2 + 344064a^3b^2c^2 + 196608abc^5 + 98304ab^5c) - (-(a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3*(-(4ac - b^2)^3)^{1/2} + a^2b*(-(4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2abc*(-(4ac - b^2)^3)^{1/2})/(2*(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2}*(229376a^2c^6 + 557056a^3c^5 + 425984a^4c^4 + 98304a^5c^3 - 8192b^3c^5 + 40960b^4c^4 - 57344b^5c^3 + 24576b^6c^2 - 221184ab^2c^5 + 327680ab^3c^4 - 90112ab^4c^3 - 49152ab^5c^2 - 393216a^2b^2c^5 - 622592a^3b^2c^4 - 196608a^4b^2c^3 + \tan(x/2)*(-(a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3*(-(4ac - b^2)^3)^{1/2} + a^2b*(-(4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8ab^4c + 2abc*(-(4ac - b^2)^3)^{1/2})/(2*(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2}*(65536ac^8 - 131072a^2c^7 - 262144a^3c^6 + 131072a^4c^5 + 196608a^5c^4 - 16384b^2c^7 + 49152b^3c^6 - 65536b^4c^5 + 65536b^5c^4 - 49152b^6c^3 + 16384b^7c^2 + 294912ab^2c^6 - 409600ab^3c^5 + 376832ab^4c^4 - 114688ab
\end{aligned}$$

$$\begin{aligned}
&^5c^3 - 16384a^2b^6c^2 + 589824a^2b^2c^6 + 720896a^3b^2c^5 - 65536a^4b^2c^4 - 655360a^2b^2c^5 + 16384a^2b^3c^4 + 196608a^2b^4c^3 - 16384 \\
&a^2b^5c^2 - 557056a^3b^2c^4 + 81920a^3b^3c^3 + 16384a^3b^4c^2 - 114688a^4b^2c^3 - 196608a^2b^2c^7) - 172032a^2b^2c^4 + 352256a^2b^3 \\
&c^3 - 106496a^3b^2c^3 + 49152a^3b^3c^2 - 24576a^4b^2c^2 + 32768a^2b^2c^6) * (- (a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3(- (4ac - b^2)^3)^{1/2} \\
&+ a^2b(- (4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8a^2b^4c + 2ab^2c(- (4ac - b^2)^3)^{1/2}) / (2(16a^2c^6 + 32a^3c^5 + 16 \\
&a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} - 49152b^5c + 24576b^6 - 16384a^2 \\
&b^4 + 32768a^3b^3 - 8192a^4b^2 + 98304a^2c^4 + 253952a^3c^3 + 180224a^4c^2 - 8192b^3c^3 + 32768b^4c^2 - 155648ab^2c^3 + 262144ab^3 \\
&c^2 - 270336a^2b^2c^3 + 237568a^2b^3c - 458752a^3b^2c^2 + 24576a^3b^2c + 16384a^2b^2c^2 + 32768ab^2c^4 - 114688ab^4c - 122880a^4b^2c \\
&+ \tan(x/2)(40960ab^4 - 57344a^4b - 73728a^4c + 8192b^4c + 24576a^5 - 8192b^5 - 81920a^2b^3 + 81920a^3b^2 + 16384a^2c^3 - 81920a^3c^2 - \\
&32768ab^2c^2 + 81920a^2b^2c - 81920a^2b^2c + 163840a^3b^2c) * (- (a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3(- (4ac - b^2)^3)^{1/2} \\
&+ a^2b(- (4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8a^2b^4c + 2ab^2c(- (4ac - b^2)^3)^{1/2}) / (2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - \\
&8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} - 65536a^3b + 49152a^3c + 49152a^4 + 16384a^2b^2 - 16384a^2b^2c) * (- (a^2b^4 - b^6 + 8a^3c^3 + 8a^4c^2 - b^3(- (4ac - b^2)^3)^{1/2} \\
&+ a^2b(- (4ac - b^2)^3)^{1/2} - 6a^3b^2c - 18a^2b^2c^2 + 8a^2b^4c + 2ab^2c(- (4ac - b^2)^3)^{1/2}) / (2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - \\
&8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} * 2i + \operatorname{atan}(\tan(x/2)(40960ab^4 - 57344a^4b - 73728a^4c + 8192b^4c + 24576a^5 - \\
&8192b^5 - 81920a^2b^3 + 81920a^3b^2 + 16384a^2c^3 - 81920a^3c^2 - 32768ab^2c^2 + 81920a^2b^2c - 81920a^2b^2c + 163840a^3b^2c) + ((b^6 - a^2b^4 - 8a^3c^3 - 8a^4c^2 - b^3(- (4ac - b^2)^3)^{1/2} \\
&+ a^2b(- (4ac - b^2)^3)^{1/2} + 6a^3b^2c + 18a^2b^2c^2 - 8a^2b^4c + 2ab^2c(- (4ac - b^2)^3)^{1/2}) / (2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - \\
&8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} * (24576a^5c - 32768ab^5 - 49152b^5c + 24576b^6 - 16384a^2b^4 + 32768a^3b^3 - 8192a^4b^2 + 98304a^2c^4 + 253952 \\
&a^3c^3 + 180224a^4c^2 - 8192b^3c^3 + 32768b^4c^2 + ((b^6 - a^2b^4 - 8a^3c^3 - 8a^4c^2 - b^3(- (4ac - b^2)^3)^{1/2} + a^2b(- (4ac - b^2)^3)^{1/2} + 6a^3b^2c + 18a^2b^2c^2 - 8a^2b^4c + 2ab^2c(- (4ac - b^2)^3)^{1/2}) / (2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - \\
&8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} * (229376a^2c^6 + 557056a^3c^5 + 425984a^4c^4 + 98304a^5c^3 - 8192b^3c^5 + 40960b^4c^4 - 57344b^5c^3 + 24576b^6c^2 - 22118 \\
&4ab^2c^5 + 327680ab^3c^4 - 90112ab^4c^3 - 49152ab^5c^2 - 393216a^2b^2c^5 - 622592a^3b^2c^4 - 196608a^4b^2c^3 - 172032a^2b^2c^4 + 352256a^2b^3c^3 - 106496a^3b^2c^3 + 49152a^3b^3c^2 - 24576a^4b^2c^2 \\
&+ 32768ab^2c^6 + \tan(x/2)((b^6 - a^2b^4 - 8a^3c^3 - 8a^4c^2 - b^3(- (4ac - b^2)^3)^{1/2} + a^2b(- (4ac - b^2)^3)^{1/2} + 6a^3b^2c + 18a^2b^2c^2 - 8a^2b^4c + 2ab^2c(- (4ac - b^2)^3)^{1/2}) / (2(16a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - \\
&8ab^2c^5 + 10ab^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} * (65536a^8c - 131072a^2c^7 - 262144a^3c^6 + 131072a^4c^5 + 196608a^5c^4 - 16384b^2c^7 + 49152b^3c^6 - 65536b^4c^5 + 65536b^5c^4 - 49152b^6c^3 + 16384b^7c^2 + 294912ab^2c^6 - 409600ab^3c^5 + 376832ab^4c^4 - 114688ab^5c^3 - 16384ab^6c^2 + 589824a^2b^2c^6 + 720896a^3b^2c^5 - 65536a^4b^2c^4 - 655360a^2b^2c^5 + 16384a^2b^3c^4 + 196608a^2b^4c^3 - 16384a^2b^5c^2 - 557056a^3b^2c^4 + 81920a^3b^3c^3 + 16384a^3b^4c^2 - 114688a^4b^2c^3 - 196608ab^2c^7) - \tan(x/2)(16384ab^6 - 65536a^2c^6 + 49152b^6c - 16384b^7 + 16384a^2b^5 - 16384a^3b^4 + 245760a^2
\end{aligned}$$

$$\begin{aligned}
& 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)} * i + (\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 + 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
\end{aligned}$$

$$\begin{aligned}
& *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)} * i) / ( \\
& (\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^
\end{aligned}$$



$$\begin{aligned}
& 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 + 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)} - 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
\end{aligned}$$

**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

$$3.16 \quad \int \frac{\cos(x)}{a+b \cos(x)+c \cos^2(x)} dx$$

**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[ExpandTrig[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] && IntegersQ[m, n, p]

#### Rubi steps

$$\begin{aligned}
\int \frac{\cos(x)}{a + b \cos(x) + c \cos^2(x)} dx &= \int \left( \frac{1 - \frac{b}{\sqrt{b^2 - 4ac}}}{b - \sqrt{b^2 - 4ac} + 2c \cos(x)} + \frac{1 + \frac{b}{\sqrt{b^2 - 4ac}}}{b + \sqrt{b^2 - 4ac} + 2c \cos(x)} \right) dx \\
&= \left( 1 - \frac{b}{\sqrt{b^2 - 4ac}} \right) \int \frac{1}{b - \sqrt{b^2 - 4ac} + 2c \cos(x)} dx + \left( 1 + \frac{b}{\sqrt{b^2 - 4ac}} \right) \int \frac{1}{b + \sqrt{b^2 - 4ac} + 2c \cos(x)} dx \\
&= \left( 2 \left( 1 - \frac{b}{\sqrt{b^2 - 4ac}} \right) \right) \text{Subst} \left[ \int \frac{1}{b + 2c - \sqrt{b^2 - 4ac} + (b - 2c - \sqrt{b^2 - 4ac}) \cos(x)} dx \right] \\
&= \frac{2 \left( 1 - \frac{b}{\sqrt{b^2 - 4ac}} \right) \tan^{-1} \left( \frac{\sqrt{b - 2c - \sqrt{b^2 - 4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b + 2c - \sqrt{b^2 - 4ac}}} \right)}{\sqrt{b - 2c - \sqrt{b^2 - 4ac}} \sqrt{b + 2c - \sqrt{b^2 - 4ac}}} + \frac{2 \left( 1 + \frac{b}{\sqrt{b^2 - 4ac}} \right) \tan^{-1} \left( \frac{\sqrt{b - 2c + \sqrt{b^2 - 4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b + 2c + \sqrt{b^2 - 4ac}}} \right)}{\sqrt{b - 2c + \sqrt{b^2 - 4ac}} \sqrt{b + 2c + \sqrt{b^2 - 4ac}}}
\end{aligned}$$

**Mathematica [A]** time = 0.57, size = 227, normalized size = 0.99

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

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\*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 = 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)\*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))\*sin(x) + (a\*b^3 - 4\*a\*b\*c^2 - (4\*a^2\*b - b^3)\*c)\*sin(x))\*sqrt(-

$$\begin{aligned}
& 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 \\
& \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)))
\end{aligned}$$

**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] 
$$\frac{2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) \frac{a^2-3}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) \frac{ab-1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) \frac{a-2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) \frac{a^2+3}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) \frac{ab-1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) \frac{a+1}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) \frac{b^2+1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) \frac{b-1}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) \frac{b^2+1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) \frac{b+2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) \frac{c(a-c)}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) \frac{b-c}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}} \operatorname{arctanh}\left(\frac{(-a+b-c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}-a+c)(a-b+c))^{1/2}}\right) \frac{-2}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) \frac{c(a+c)}{(-4ac+b^2)^{1/2}} \frac{1}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) \frac{b-c}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right) \frac{b-c}{(a-b+c)} \frac{1}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}} \operatorname{arctan}\left(\frac{(a-b+c)\tan(1/2x)}{(((-4ac+b^2)^{1/2}+a-c)(a-b+c))^{1/2}}\right)$$

**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] 
$$\operatorname{atan}\left(\frac{\tan(x/2)(96ab^2 - 128a^2b - 64ac^2 + 32b^2c + 64a^3 - 32b^3)}{(8a^3c + b(-4ac - b^2)^3)^{1/2}}\right) + \frac{b^4 - 2a^2b^2 + 8a^2c^2}{(8a^3c + b(-4ac - b^2)^3)^{1/2}}$$

$$\begin{aligned}
& - 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)}*i + (\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)}*i)/(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)}*(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)} + (\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)}))*((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 + \operatorname{atan}(((\tan(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 -
\end{aligned}$$



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



$$3.17 \quad \int \frac{1}{a+b \cos(x)+c \cos^2(x)} dx$$

**Optimal.** Leaf size=223

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

[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}

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

Antiderivative was successfully verified.

[In] Int[(a + b\*cos[x] + c\*cos[x]^2)^(-1), x]

[Out]  $(4*c*\text{ArcTan}[(\text{Sqrt}[b-2*c-\text{Sqrt}[b^2-4*a*c]]*\text{Tan}[x/2])/(\text{Sqrt}[b+2*c-\text{Sqrt}[b^2-4*a*c]])]/(\text{Sqrt}[b^2-4*a*c]*\text{Sqrt}[b-2*c-\text{Sqrt}[b^2-4*a*c]]*\text{Sqrt}[b+2*c-\text{Sqrt}[b^2-4*a*c]]) - (4*c*\text{ArcTan}[(\text{Sqrt}[b-2*c+\text{Sqrt}[b^2-4*a*c]]*\text{Tan}[x/2])/(\text{Sqrt}[b+2*c+\text{Sqrt}[b^2-4*a*c]])]/(\text{Sqrt}[b^2-4*a*c]*\text{Sqrt}[b-2*c+\text{Sqrt}[b^2-4*a*c]]*\text{Sqrt}[b+2*c+\text{Sqrt}[b^2-4*a*c]]))$

#### 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

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

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

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

**Mathematica [A]** time = 0.41, size = 198, normalized size = 0.89

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

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)\*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)))/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)))/sin(x)

$$\frac{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c)}{(a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c)} \log(b^2c \cos(x) + 2bc^2 - (4ac^4 + (8a^2 - b^2)c^3 + 2(2a^3 - 3ab^2)c^2 - (a^2b^2 - b^4)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c}) \cos(x) - 1/2 \sqrt{2} ((a^2b^4 - b^6 + 8ac^5 + 2(12a^2 - b^2)c^4 + 6(4a^3 - 3ab^2)c^3 + (8a^4 - 22a^2b^2 + 3b^4)c^2 - 2(3a^3b^2 - 4ab^4)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c}) \sin(x) + (b^4 - 4ab^2c) \sin(x)) \sqrt{-(b^2 - 2ac - 2c^2 - (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c)}}) + 1/4 \sqrt{2} \sqrt{-(b^2 - 2ac - 2c^2 + (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c)}}) / (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c)} \log(-b^2c \cos(x) - 2bc^2 - (4ac^4 + (8a^2 - b^2)c^3 + 2(2a^3 - 3ab^2)c^2 - (a^2b^2 - b^4)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c}) \cos(x) + 1/2 \sqrt{2} ((a^2b^4 - b^6 + 8ac^5 + 2(12a^2 - b^2)c^4 + 6(4a^3 - 3ab^2)c^3 + (8a^4 - 22a^2b^2 + 3b^4)c^2 - 2(3a^3b^2 - 4ab^4)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c}) \sin(x) - (b^4 - 4ab^2c) \sin(x)) \sqrt{-(b^2 - 2ac - 2c^2 + (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c)}}) / (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c)} - 1/4 \sqrt{2} \sqrt{-(b^2 - 2ac - 2c^2 + (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c)}}) / (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c)} \log(-b^2c \cos(x) - 2bc^2 - (4ac^4 + (8a^2 - b^2)c^3 + 2(2a^3 - 3ab^2)c^2 - (a^2b^2 - b^4)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c}) \cos(x) - 1/2 \sqrt{2} ((a^2b^4 - b^6 + 8ac^5 + 2(12a^2 - b^2)c^4 + 6(4a^3 - 3ab^2)c^3 + (8a^4 - 22a^2b^2 + 3b^4)c^2 - 2(3a^3b^2 - 4ab^4)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c}) \sin(x) - (b^4 - 4ab^2c) \sin(x)) \sqrt{-(b^2 - 2ac - 2c^2 + (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^2)c) \sqrt{b^2/(a^4b^2 - 2a^2b^4 + b^6 - 4ac^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c)}}) / (a^2b^2 - b^4 - 4ac^3 - (8a^2 - b^2)c^2 - 2(2a^3 - 3ab^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

$$\begin{aligned}
& ^3c^2 - 48a^2b^2c^2 - 24a^2b^2c^2 - 6b^3c^2 + 32a^2c^3 + 24a^2b^2c^3 \\
& + 4b^2c^3 - 16a^2c^4 + 3\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c) \\
& )^2b^2 - 2\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^3 - 5\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2b^4 - 12\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2a^3c + 8\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^2c + 34\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^2c + 6\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2b^3c - 56\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2a^2c^2 - 24\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^2c^2 - 5\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2b^2c^2 + 20\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2a^2c^3 + 3\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2b - 2(b^2 - 4ac)a^2b - 2\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2b^2 - 5\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}b^3 + 2(b^2 - 4ac)b^3 + 6\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2c + 12(b^2 - 4ac)a^2c + 10\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2b^2c - 12(b^2 - 4ac)a^2b^2c - 4\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}b^2c - 4(b^2 - 4ac)b^2c + 28\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2c^2 + 8(b^2 - 4ac)a^2c^2 + 7\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}b^2c^2 + 6(b^2 - 4ac)b^2c^2 - 10\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}c^3 - 4(b^2 - 4ac)c^3)(\pi\text{floor}(1/2x/\pi + 1/2) + \arctan(2\sqrt{1/2}\tan(1/2x)/\sqrt{(2a - 2c + \sqrt{-4(a + b + c)(a - b + c) + 4(a - c)^2})/(a - b + c)}))\text{abs}(a - b + c)/(3a^5b^2 - 5a^4b^3 - 6a^3b^4 + 10a^2b^5 + 3a^2b^6 - 5b^7 - 12a^6c + 20a^5b^2c + 47a^4b^2c - 60a^3b^3c - 46a^2b^4c + 40a^2b^5c + 11b^6c - 92a^5c^2 + 80a^4b^2c^2 + 182a^3b^2c^2 - 94a^2b^3c^2 - 78a^2b^4c^2 - 6b^5c^2 - 184a^4c^3 + 56a^3b^2c^3 + 166a^2b^2c^3 + 36a^2b^3c^3 - 6b^4c^3 - 120a^3c^4 - 48a^2b^2c^4 + 23a^2b^3c^4 + 11b^3c^4 + 4a^2c^5 - 44a^2b^2c^5 - 5b^2c^5 + 20a^2c^6) - (2a^2b^3 - 2b^5 - 8a^3b^2c - 12a^2b^2c + 20a^2b^3c + 4b^4c + 48a^3c^2 - 48a^2b^2c^2 - 24a^2b^2c^2 - 6b^3c^2 + 32a^2c^3 + 24a^2b^2c^3 + 4b^2c^3 - 16a^2c^4 - 3\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^2 + 2\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^3 + 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2b^4 + 12\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2a^3c - 8\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^2c - 34\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^2c - 6\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2b^3c + 56\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2a^2c^2 + 24\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2a^2b^2c^2 + 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2b^2c^2 - 20\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2a^2c^3 + 3\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2b - 2(b^2 - 4ac)a^2b - 2\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2b^2 - 5\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}b^3 + 2(b^2 - 4ac)b^3 + 6\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2c + 12(b^2 - 4ac)a^2c + 10\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2b^2c - 12(b^2 - 4ac)a^2b^2c - 4\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}b^2c - 4(b^2 - 4ac)b^2c + 28\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}a^2c^2 + 8(b^2 - 4ac)a^2c^2 + 7\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}b^2c^2 + 6(b^2 - 4ac)b^2c^2 - 10\sqrt{a^2 - ab + bc - c^2 - \sqrt{b^2 - 4ac}}(a - b + c))^2\sqrt{b^2 - 4ac}c^3 - 4(b^2 - 4ac)c^3)(\pi\text{floor}(1/2x/\pi + 1/2) + \arctan(
\end{aligned}$$

$$2*\sqrt{1/2}*\tan(1/2*x)/\sqrt{((2*a - 2*c - \sqrt{-4*(a + b + c)*(a - b + c) + 4*(a - c)^2})/(a - b + c)))*\text{abs}(a - b + c)/(3*a^5*b^2 - 5*a^4*b^3 - 6*a^3*b^4 + 10*a^2*b^5 + 3*a*b^6 - 5*b^7 - 12*a^6*c + 20*a^5*b*c + 47*a^4*b^2*c - 60*a^3*b^3*c - 46*a^2*b^4*c + 40*a*b^5*c + 11*b^6*c - 92*a^5*c^2 + 80*a^4*b*c^2 + 182*a^3*b^2*c^2 - 94*a^2*b^3*c^2 - 78*a*b^4*c^2 - 6*b^5*c^2 - 184*a^4*c^3 + 56*a^3*b*c^3 + 166*a^2*b^2*c^3 + 36*a*b^3*c^3 - 6*b^4*c^3 - 120*a^3*c^4 - 48*a^2*b*c^4 + 23*a*b^2*c^4 + 11*b^3*c^4 + 4*a^2*c^5 - 44*a*b*c^5 - 5*b^2*c^5 + 20*a*c^6)$$

**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)}*\text{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)}*\text{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)}*\text{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)}*\text{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)}*\text{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)}*\text{arctan}((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)}*\text{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)}*\text{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)}*\text{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)}*\text{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)}*\text{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)}*\text{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)}*\text{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)}*\text{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)}*\text{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 + 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) - (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)))

$$\begin{aligned}
& *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)}*i - \operatorname{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)}*i + (\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)}*i)/(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 -
\end{aligned}$$

$$32*a^2*b^2*c^2 + 10*a*b^4*c))^{(1/2)))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^{(1/2)} + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c))^{(1/2)}*2i$$

**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



$$3.18 \quad \int \frac{\sec(x)}{a+b \cos(x)+c \cos^2(x)} dx$$

**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]]\*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]]) - (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[ExpandTrig[cos[d + e\*x]^m\*(a + b\*cos[d + e\*x]^n + c\*cos[d + e\*x]^(2\*n))^p, x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2\*n] && NeQ[b^2 - 4\*a\*c, 0] && IntegersQ[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

$$\begin{aligned} \int \frac{\sec(x)}{a + b \cos(x) + c \cos^2(x)} dx &= \int \left( \frac{-b - c \cos(x)}{a(a + b \cos(x) + c \cos^2(x))} + \frac{\sec(x)}{a} \right) dx \\ &= \frac{\int \frac{-b - c \cos(x)}{a + b \cos(x) + c \cos^2(x)} dx}{a} + \frac{\int \sec(x) dx}{a} \\ &= \frac{\tanh^{-1}(\sin(x))}{a} - \frac{\left( c \left( 1 - \frac{b}{\sqrt{b^2 - 4ac}} \right) \right) \int \frac{1}{b + \sqrt{b^2 - 4ac} + 2c \cos(x)} dx}{a} - \frac{\left( c \left( 1 + \frac{b}{\sqrt{b^2 - 4ac}} \right) \right) \int \frac{1}{b - \sqrt{b^2 - 4ac} + 2c \cos(x)} dx}{a} \\ &= \frac{\tanh^{-1}(\sin(x))}{a} - \frac{\left( 2c \left( 1 - \frac{b}{\sqrt{b^2 - 4ac}} \right) \right) \text{Subst} \left( \int \frac{1}{b + 2c + \sqrt{b^2 - 4ac} + (b - 2c + \sqrt{b^2 - 4ac})x^2} dx, x, \frac{\tan(x/2)}{\sqrt{b^2 - 4ac}} \right)}{a} - \frac{\left( 2c \left( 1 + \frac{b}{\sqrt{b^2 - 4ac}} \right) \right) \text{Subst} \left( \int \frac{1}{b - 2c + \sqrt{b^2 - 4ac} + (b + 2c + \sqrt{b^2 - 4ac})x^2} dx, x, \frac{\tan(x/2)}{\sqrt{b^2 - 4ac}} \right)}{a} \\ &= -\frac{2c \left( 1 + \frac{b}{\sqrt{b^2 - 4ac}} \right) \tan^{-1} \left( \frac{\sqrt{b - 2c - \sqrt{b^2 - 4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b + 2c - \sqrt{b^2 - 4ac}}} \right)}{a \sqrt{b - 2c - \sqrt{b^2 - 4ac}} \sqrt{b + 2c - \sqrt{b^2 - 4ac}}} - \frac{2c \left( 1 - \frac{b}{\sqrt{b^2 - 4ac}} \right) \tan^{-1} \left( \frac{\sqrt{b - 2c - \sqrt{b^2 - 4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b + 2c - \sqrt{b^2 - 4ac}}} \right)}{a \sqrt{b - 2c + \sqrt{b^2 - 4ac}} \sqrt{b + 2c + \sqrt{b^2 - 4ac}}} \end{aligned}$$

**Mathematica [A]** time = 0.67, size = 281, normalized size = 1.15

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

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
```



$$\sqrt[1/2]{b-c} / \sqrt{-4ac+b^2} / (a-b+c) / ((\sqrt{-4ac+b^2}+a-c) * (a-b+c))^{1/2} * \arctan((a-b+c) * \tan(1/2*x) / ((\sqrt{-4ac+b^2}+a-c) * (a-b+c))^{1/2}) * b$$

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

$$4a \int \frac{2bc \cos(3x)^2 + 2bc \cos(x)^2 + 2bc \sin(3x)^2 + 2bc \sin(x)^2 + 4(2ab+bc) \cos(2x)^2 + c^2 \cos(x) + 4(2ab+bc) \cos(4x)^2 + 4ab^2 \cos(3x)^2 + 4ab^2 \cos(x)^2 + ac^2 \sin(4x)^2 + 4ab^2 \sin(3x)^2 + 4ab^2 \sin(x)^2 + 4abc \cos(x) + ac^2 + 4(4a^3 + 4a^2c + ac^2) \cos(2x)^2 + 4(4a^3 + 4a^2c + ac^2) \cos(4x)^2}{ac^2 \cos(4x)^2 + 4ab^2 \cos(3x)^2 + 4ab^2 \cos(x)^2 + ac^2 \sin(4x)^2 + 4ab^2 \sin(3x)^2 + 4ab^2 \sin(x)^2 + 4abc \cos(x) + ac^2 + 4(4a^3 + 4a^2c + ac^2) \cos(2x)^2 + 4(4a^3 + 4a^2c + ac^2) \cos(4x)^2} dx$$

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] 
$$-1/2 * (2*a * \int (2*b*c*cos(3*x)^2 + 2*b*c*cos(x)^2 + 2*b*c*sin(3*x)^2 + 2*b*c*sin(x)^2 + 4*(2*a*b + b*c)*cos(2*x)^2 + c^2*cos(x) + 4*(2*a*b + b*c)*sin(2*x)^2 + 2*(2*b^2 + 2*a*c + c^2)*sin(2*x)*sin(x) + (c^2*cos(3*x) + 2*b*c*cos(2*x) + c^2*cos(x))*cos(4*x) + (4*b*c*cos(x) + c^2 + 2*(2*b^2 + 2*a*c + c^2)*cos(2*x))*cos(3*x) + 2*(b*c + (2*b^2 + 2*a*c + c^2)*cos(x))*cos(2*x) + (c^2*sin(3*x) + 2*b*c*sin(2*x) + c^2*sin(x))*sin(4*x) + 2*(2*b*c*sin(x) + (2*b^2 + 2*a*c + c^2)*sin(2*x))*sin(3*x)) / (a*c^2*cos(4*x)^2 + 4*a*b^2*cos(3*x)^2 + 4*a*b^2*cos(x)^2 + a*c^2*sin(4*x)^2 + 4*a*b^2*sin(3*x)^2 + 4*a*b^2*sin(x)^2 + 4*a*b*c*cos(x) + a*c^2 + 4*(4*a^3 + 4*a^2*c + a*c^2)*cos(2*x)^2 + 4*(4*a^3 + 4*a^2*c + a*c^2)*sin(2*x)^2 + 8*(2*a^2*b + a*b*c)*sin(2*x)*sin(x) + 2*(2*a*b*c*cos(3*x) + 2*a*b*c*cos(x) + a*c^2 + 2*(2*a^2*c + a*c^2)*cos(2*x))*cos(4*x) + 4*(2*a*b^2*cos(x) + a*b*c + 2*(2*a^2*b + a*b*c)*cos(2*x))*cos(3*x) + 4*(2*a^2*c + a*c^2 + 2*(2*a^2*b + a*b*c)*cos(x))*cos(2*x) + 4*(a*b*c*sin(3*x) + a*b*c*sin(x) + (2*a^2*c + a*c^2)*sin(2*x))*sin(4*x) + 8*(a*b^2*sin(x) + (2*a^2*b + a*b*c)*sin(2*x))*sin(3*x)), x) - \log(\cos(x)^2 + \sin(x)^2 + 2*\sin(x) + 1) + \log(\cos(x)^2 + \sin(x)^2 - 2*\sin(x) + 1)) / a$$

**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 * \operatorname{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 + 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) - (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 + 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) + (147456 * c^5 * \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) + (262144 * a^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 + (229376 * b^3 * c^2) / a - (32768 * b^2 * c^4) / a^2 + (32768 * b^3 * c^3) / a^2 + (32$$

$$\begin{aligned}
& 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 + 13 \\
& 1072*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 + 65536 \\
& 0*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 - 1 \\
& 31072*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 + (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) - (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 - 26214 \\
& 4*a*b*c^2 - 131072*a*b^2*c) + (131072*b^3*c*\tan(x/2))/(655360*a*c^3 - 39321 \\
& 6*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 - 1 \\
& 31072*a*b^2*c) - (32768*b^2*c^4*\tan(x/2))/(147456*a*c^5 - 16384*a*b^5 - 327 \\
& 68*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 + 22937 \\
& 6*a*b^3*c^2 - 393216*a^2*b*c^3 + 131072*a^2*b^3*c - 262144*a^3*b*c^2 - 1310 \\
& 72*a^3*b^2*c - 360448*a^2*b^2*c^2 - 147456*a*b*c^4 + 49152*a*b^4*c) + (3276 \\
& 8*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 + 327 \\
& 68*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))/(1 \\
& 47456*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*
\end{aligned}$$

$$\begin{aligned}
& c^2 + (147456c^5)/a - 360448b^2c^2 - (147456b^4c^4)/a + (49152b^4c^4)/a \\
& - (32768b^5c)/a^2 - (262144b^2c^3)/a + (229376b^3c^2)/a - (32768b^2c^4)/a^2 + (32768b^3c^3)/a^2 + (32768b^4c^2)/a^2 - 262144ab^2c^2 - 131072a^2b^2c \\
& - (131072ab^2c^2 \tan(x/2))/(655360a^3c^3 - 393216b^3c^3 + 131072b^3c^3 + 16384b^4 + 540672c^4 - (16384b^5)/a + 262144a^2c^2 + (147456c^5)/a - 360448b^2c^2 - (147456b^4c^4)/a + (49152b^4c^4)/a - (32768b^5c)/a^2 - (262144b^2c^3)/a + (229376b^3c^2)/a - (32768b^2c^4)/a^2 + (32768b^3c^3)/a^2 + (32768b^4c^2)/a^2 - 262144ab^2c^2 - 131072a^2b^2c \\
& ))/a - \operatorname{atan}\left(\frac{((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}}{(2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2}}\right) \cdot (24576a^5c^5 - 49152ab^5c^5 - 32768b^5c^5 + 24576b^6 + 32768a^2b^4 - 8192a^3b^3 + 180224a^2c^4 + 253952a^3c^3 + 98304a^4c^2 - 8192b^2c^4 + 32768b^3c^3 - 16384b^4c^2 + (\tan(x/2)(49152ab^6 - 65536a^6c^6 + 16384b^6c^6 - 16384b^7 - 65536a^2b^5 + 65536a^3b^4 - 49152a^4b^3 + 16384a^5b^2 - 147456a^2c^5 + 212992a^3c^4 + 671744a^4c^3 + 245760a^5c^2 - 16384b^4c^3 + 16384b^5c^2 + 98304ab^2c^4 - 65536ab^3c^3 - 180224ab^4c^2 + 49152a^2b^2c^4 - 393216a^2b^4c - 1081344a^3b^2c^3 + 475136a^3b^3c - 802816a^4b^2c^2 - 327680a^4b^2c + 344064a^2b^2c^3 + 180224a^2b^3c^2 + 557056a^3b^2c^2 + 98304ab^5c + 196608a^5b^2c) + ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}}{(2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2}}) \cdot (57344a^3b^5 - 24576a^2b^6 - 40960a^4b^4 + 8192a^5b^3 - 98304a^3c^5 - 425984a^4c^4 - 557056a^5c^3 - 229376a^6c^2 + 49152a^2b^5c + 196608a^3b^2c^4 + 90112a^3b^4c + 622592a^4b^2c^3 - 327680a^4b^3c + 393216a^5b^2c^2 + 221184a^5b^2c + \tan(x/2)((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}}{(2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2}}) \cdot (65536a^8c^8 + 16384a^2b^7 - 49152a^3b^6 + 65536a^4b^5 - 65536a^5b^4 + 49152a^6b^3 - 16384a^7b^2 + 196608a^4c^5 + 131072a^5c^4 - 262144a^6c^3 - 131072a^7c^2 - 16384a^2b^6c - 114688a^3b^5c - 65536a^4b^4c^2 + 376832a^4b^4c + 720896a^5b^3c^3 - 409600a^5b^3c + 589824a^6b^2c^2 + 294912a^6b^2c + 16384a^2b^4c^3 - 16384a^2b^5c^2 - 114688a^3b^2c^4 + 81920a^3b^3c^3 + 196608a^3b^4c^2 - 557056a^4b^2c^3 + 16384a^4b^3c^2 - 655360a^5b^2c^2 - 196608a^7b^2c) + 24576a^2b^2c^4 - 49152a^2b^3c^3 + 106496a^3b^2c^3 - 352256a^3b^3c^2 + 172032a^4b^2c^2 - 32768a^6b^2c) \cdot ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}}{(2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2}} + 24576ab^2c^3 + 237568ab^3c^2 - 458752a^2b^2c^3 + 262144a^2b^3c - 270336a^3b^2c^2 - 155648a^3b^2c + 16384a^2b^2c^2 - 122880ab^2c^4 - 114688ab^4c^2 + 32768a^4b^2c) + \tan(x/2)(8192ab^4 - 73728a^2c^4 - 57344b^2c^4 + 40960b^4c - 8192b^5 + 24576c^5 - 81920a^2c^3 + 16384a^3c^2 + 81920b^2c^3 - 81920b^3c^2 - 81920ab^2c^2 + 81920a^2b^2c^2 - 32768a^2b^2c + 163840ab^2c^3) \cdot ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}}{(2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2}} + 1i - (((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2ab^2c(-4ac - b^2)^3)^{1/2}
\end{aligned}$$

$$\begin{aligned}
& 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
\end{aligned}$$

$$\begin{aligned}
& 56a^3b^2c^2 + 98304ab^5c + 196608a^5b^2c) + ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2abc(-4ac - b^2)^3)^{1/2} / (2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2} \\
& (57344a^3b^5 - 24576a^2b^6 - 40960a^4b^4 + 8192a^5b^3 - 98304a^3c^5 - 425984a^4c^4 - 557056a^5c^3 - 229376a^6c^2 + 49152a^2b^5c + 196608a^3b^2c^4 + 90112a^3b^4c + 622592a^4b^2c^3 - 327680a^4b^3c + 393216a^5b^2c^2 + 221184a^5b^2c + \tan(x/2) * ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2abc(-4ac - b^2)^3)^{1/2} / (2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2} \\
& (65536a^8c + 16384a^2b^7 - 49152a^3b^6 + 65536a^4b^5 - 65536a^5b^4 + 49152a^6b^3 - 16384a^7b^2 + 196608a^4c^5 + 131072a^5c^4 - 262144a^6c^3 - 131072a^7c^2 - 16384a^2b^6c - 114688a^3b^5c - 65536a^4b^4c + 376832a^4b^4c + 720896a^5b^2c^3 - 409600a^5b^3c + 589824a^6b^2c^2 + 294912a^6b^2c + 16384a^2b^4c^3 - 16384a^2b^5c^2 - 114688a^3b^2c^4 + 81920a^3b^3c^3 + 196608a^3b^4c^2 - 557056a^4b^2c^3 + 16384a^4b^3c^2 - 655360a^5b^2c^2 - 196608a^7b^2c + 24576a^2b^2c^4 - 49152a^2b^3c^3 + 106496a^3b^2c^3 - 352256a^3b^3c^2 + 172032a^4b^2c^2 - 32768a^6b^2c) * ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} / (2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2} + 24576ab^2c^3 + 237568ab^3c^2 - 458752a^2b^2c^3 + 262144a^2b^3c - 270336a^3b^2c^2 - 155648a^3b^2c + 16384a^2b^2c^2 - 122880abc^4 - 114688ab^4c + 32768a^4b^2c) + \tan(x/2) * (8192ab^4 - 73728a^2c^4 - 57344b^2c^4 + 40960b^4c - 8192b^5 + 24576c^5 - 81920a^2c^3 + 16384a^3c^2 + 81920b^2c^3 - 81920b^3c^2 - 81920ab^2c^2 + 81920a^2b^2c^2 - 32768a^2b^2c + 163840abc^3) * ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2abc(-4ac - b^2)^3)^{1/2} / (2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2} + (((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2abc(-4ac - b^2)^3)^{1/2} / (2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2} \\
& (24576a^5c^5 - 49152ab^5 - 32768b^5c + 24576b^6 + 32768a^2b^4 - 8192a^3b^3 + 180224a^2c^4 + 253952a^3c^3 + 98304a^4c^2 - 8192b^2c^4 + 32768b^3c^3 - 16384b^4c^2 - (\tan(x/2) * (49152ab^6 - 65536a^6c + 16384b^6c - 16384b^7 - 65536a^2b^5 + 65536a^3b^4 - 49152a^4b^3 + 16384a^5b^2 - 147456a^2c^5 + 212992a^3c^4 + 671744a^4c^3 + 245760a^5c^2 - 16384b^4c^3 + 16384b^5c^2 + 98304ab^2c^4 - 65536ab^3c^3 - 180224ab^4c^2 + 49152a^2b^2c^4 - 393216a^2b^4c - 1081344a^3b^2c^3 + 475136a^3b^3c - 802816a^4b^2c^2 - 327680a^4b^2c + 344064a^2b^2c^3 + 180224a^2b^3c^2 + 557056a^3b^2c^2 + 98304ab^5c + 196608a^5b^2c) + ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8ab^4c + 2abc(-4ac - b^2)^3)^{1/2} / (2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{1/2} * (24576a^2b^6 - 57344a^3b^5 + 40960a^4b^4 - 8192a^5b^3 + 98304a^3c^5 + 425984a^4c^4 + 557056a^5c^3 + 229376a^6c^2 - 49152a^2b^5c - 196608a^3b^2c^4 - 90112a^3b^4c - 622592a^4b^2c^3 + 327680a^4b^3c - 393216a^5b^2c^2 - 221184a^5b^2c + \tan(x/2) * ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{1/2} + b^4c^2 - 6ab^2c^3 + b^2c^2(-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8
\end{aligned}$$



$$\begin{aligned}
& *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) - 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 - 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)} - 49152*a*c^3 + 65536*b*c^3 - 49152*c^4 - 16384*b^2*c^2 + 16384*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 + \operatorname{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 + 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)} * (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
\end{aligned}$$

$$\begin{aligned}
& *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 - 491 \\
& 52*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 - 655 \\
& 36*a*b^3*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c^4 - 393216*a^2*b^4*c - 1081 \\
& 344*a^3*b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a^4*b^2*c + 34 \\
& 4064*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 + 327 \\
& 68*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)} * i + (\tan(x/2)*(8192*a*b^4 - 73728*a*c^4 - 57344*b*c^4 + 4 \\
& 0960*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*
\end{aligned}$$

$$\begin{aligned}
& a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4 \\
& *b^2c^2))^{(1/2)} + 32768a^2b^4 - 8192a^3b^3 + 180224a^2c^4 + 253952* \\
& a^3c^3 + 98304a^4c^2 - 8192b^2c^4 + 32768b^3c^3 - 16384b^4c^2 + 24 \\
& 576a*b^2c^3 + 237568a*b^3c^2 - 458752a^2b*c^3 + 262144a^2b^3c - 27 \\
& 0336a^3b*c^2 - 155648a^3b^2c + 16384a^2b^2c^2 - 122880a*b*c^4 - 11 \\
& 4688a*b^4c + 32768a^4b*c)) * (-(b^6 - 8a^2c^4 - 8a^3c^3 - b^3*(-(4a* \\
& c - b^2)^3)^{(1/2)} - b^4c^2 + 6a*b^2c^3 + b*c^2*(-(4a*c - b^2)^3)^{(1/2)} \\
& + 18a^2b^2c^2 - 8a*b^4c + 2a*b*c*(-(4a*c - b^2)^3)^{(1/2)}) / (2*(a^4b^4 \\
& - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b \\
& ^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{(1/2)} * i) / ((\tan(x/2) \\
& *(8192a*b^4 - 73728a*c^4 - 57344b*c^4 + 40960b^4c - 8192b^5 + 24576c \\
& ^5 - 81920a^2c^3 + 16384a^3c^2 + 81920b^2c^3 - 81920b^3c^2 - 81920* \\
& a*b^2c^2 + 81920a^2b*c^2 - 32768a^2b^2c + 163840a*b*c^3) - (-(b^6 - \\
& 8a^2c^4 - 8a^3c^3 - b^3*(-(4a*c - b^2)^3)^{(1/2)} - b^4c^2 + 6a*b^2c^3 \\
& + b*c^2*(-(4a*c - b^2)^3)^{(1/2)} + 18a^2b^2c^2 - 8a*b^4c + 2a*b*c*(- \\
& -(4a*c - b^2)^3)^{(1/2)}) / (2*(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + \\
& 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32* \\
& a^4b^2c^2))^{(1/2)} * (24576a*c^5 - 49152a*b^5 - 32768b^5c + 24576b^6 - \\
& ((-(b^6 - 8a^2c^4 - 8a^3c^3 - b^3*(-(4a*c - b^2)^3)^{(1/2)} - b^4c^2 + \\
& 6a*b^2c^3 + b*c^2*(-(4a*c - b^2)^3)^{(1/2)} + 18a^2b^2c^2 - 8a*b^4c \\
& + 2a*b*c*(-(4a*c - b^2)^3)^{(1/2)}) / (2*(a^4b^4 - a^2b^6 + 16a^4c^4 + 32 \\
& *a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32* \\
& a^4b^2c^2))^{(1/2)} * (24576a^2b^6 - 57344a^3b^5 + 40960a^4* \\
& b^4 - 8192a^5b^3 + 98304a^3c^5 + 425984a^4c^4 + 557056a^5c^3 + 2293 \\
& 76a^6c^2 - 49152a^2b^5c - 196608a^3b*c^4 - 90112a^3b^4c - 622592* \\
& a^4b*c^3 + 327680a^4b^3c - 393216a^5b*c^2 - 221184a^5b^2c - 24576* \\
& a^2b^2c^4 + 49152a^2b^3c^3 - 106496a^3b^2c^3 + 352256a^3b^3c^2 - \\
& 172032a^4b^2c^2 + 32768a^6b*c + \tan(x/2) * (-(b^6 - 8a^2c^4 - 8a^3c^3 \\
& ^3 - b^3*(-(4a*c - b^2)^3)^{(1/2)} - b^4c^2 + 6a*b^2c^3 + b*c^2*(-(4a*c \\
& - b^2)^3)^{(1/2)} + 18a^2b^2c^2 - 8a*b^4c + 2a*b*c*(-(4a*c - b^2)^3)^{( \\
& 1/2)}) / (2*(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3 \\
& *b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{(1/2)} \\
& ) * (65536a^8c + 16384a^2b^7 - 49152a^3b^6 + 65536a^4b^5 - 65536a^5* \\
& b^4 + 49152a^6b^3 - 16384a^7b^2 + 196608a^4c^5 + 131072a^5c^4 - 262 \\
& 144a^6c^3 - 131072a^7c^2 - 16384a^2b^6c - 114688a^3b^5c - 65536a \\
& ^4b*c^4 + 376832a^4b^4c + 720896a^5b*c^3 - 409600a^5b^3c + 589824* \\
& a^6b*c^2 + 294912a^6b^2c + 16384a^2b^4c^3 - 16384a^2b^5c^2 - 1146 \\
& 88a^3b^2c^4 + 81920a^3b^3c^3 + 196608a^3b^4c^2 - 557056a^4b^2c^3 \\
& + 16384a^4b^3c^2 - 655360a^5b^2c^2 - 196608a^7b*c)) + \tan(x/2) * (4 \\
& 9152a*b^6 - 65536a^6c + 16384b^6c - 16384b^7 - 65536a^2b^5 + 65536* \\
& a^3b^4 - 49152a^4b^3 + 16384a^5b^2 - 147456a^2c^5 + 212992a^3c^4 + \\
& 671744a^4c^3 + 245760a^5c^2 - 16384b^4c^3 + 16384b^5c^2 + 98304a* \\
& b^2c^4 - 65536a*b^3c^3 - 180224a*b^4c^2 + 49152a^2b*c^4 - 393216a^2 \\
& *b^4c - 1081344a^3b*c^3 + 475136a^3b^3c - 802816a^4b*c^2 - 327680a \\
& ^4b^2c + 344064a^2b^2c^3 + 180224a^2b^3c^2 + 557056a^3b^2c^2 + 9 \\
& 8304a*b^5c + 196608a^5b*c)) * (-(b^6 - 8a^2c^4 - 8a^3c^3 - b^3*(-(4a* \\
& c - b^2)^3)^{(1/2)} - b^4c^2 + 6a*b^2c^3 + b*c^2*(-(4a*c - b^2)^3)^{(1/2)} \\
& + 18a^2b^2c^2 - 8a*b^4c + 2a*b*c*(-(4a*c - b^2)^3)^{(1/2)}) / (2*(a^4b \\
& ^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5* \\
& b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4b^2c^2))^{(1/2)} + 32768a^2b \\
& ^4 - 8192a^3b^3 + 180224a^2c^4 + 253952a^3c^3 + 98304a^4c^2 - 8192* \\
& b^2c^4 + 32768b^3c^3 - 16384b^4c^2 + 24576a*b^2c^3 + 237568a*b^3c^2 \\
& - 458752a^2b*c^3 + 262144a^2b^3c - 270336a^3b*c^2 - 155648a^3b^2 \\
& *c + 16384a^2b^2c^2 - 122880a*b*c^4 - 114688a*b^4c + 32768a^4b*c)) * \\
& (-(b^6 - 8a^2c^4 - 8a^3c^3 - b^3*(-(4a*c - b^2)^3)^{(1/2)} - b^4c^2 + 6 \\
& *a*b^2c^3 + b*c^2*(-(4a*c - b^2)^3)^{(1/2)} + 18a^2b^2c^2 - 8a*b^4c + \\
& 2a*b*c*(-(4a*c - b^2)^3)^{(1/2)}) / (2*(a^4b^4 - a^2b^6 + 16a^4c^4 + 32* \\
& ^5c^3 + 16a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2* \\
& c^3 - 32a^4b^2c^2))^{(1/2)} - (\tan(x/2) * (8192a*b^4 - 73728a*c^4 - 57344
\end{aligned}$$

```

*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)*(5
7344*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 + 196
608*a^3*b*c^4 + 90112*a^3*b^4*c + 622592*a^4*b*c^3 - 327680*a^4*b^3*c + 393
216*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 - 4
9152*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 - 163
84*a^2*b^6*c - 114688*a^3*b^5*c - 65536*a^4*b*c^4 + 376832*a^4*b^4*c + 7208
96*a^5*b*c^3 - 409600*a^5*b^3*c + 589824*a^6*b*c^2 + 294912*a^6*b^2*c + 163
84*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 + 47513
6*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a^4*b^2*c + 344064*a^2*b^2*c^3 + 18
0224*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) + 49
152*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)
```

$$3.19 \quad \int \frac{\sec^2(x)}{a+b \cos(x)+c \cos^2(x)} dx$$

**Optimal.** Leaf size=275

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

[Out]  $-b \operatorname{arctanh}(\sin(x))/a^2 + 2bc \operatorname{arctan}((b-2c - (-4ac+b^2)^{1/2})^{1/2} \tan(1/2x) / (b+2c - (-4ac+b^2)^{1/2})^{1/2}) * (1 + (-2ac+b^2)/b / (-4ac+b^2)^{1/2}) / a^2 / (b-2c - (-4ac+b^2)^{1/2})^{1/2} / (b+2c - (-4ac+b^2)^{1/2})^{1/2} + 2bc \operatorname{arctan}((b-2c + (-4ac+b^2)^{1/2})^{1/2} \tan(1/2x) / (b+2c + (-4ac+b^2)^{1/2})^{1/2}) * (1 + (2ac-b^2)/b / (-4ac+b^2)^{1/2}) / a^2 / (b-2c + (-4ac+b^2)^{1/2})^{1/2} / (b+2c + (-4ac+b^2)^{1/2})^{1/2} + \tan(x)/a$

**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}

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

Antiderivative was successfully verified.

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

[Out]  $(2bc*(1 + (b^2 - 2ac)/(b\sqrt{b^2 - 4ac}))*\operatorname{ArcTan}[(\sqrt{b - 2c - \sqrt{b^2 - 4ac}})*\operatorname{Tan}[x/2])/\sqrt{b + 2c - \sqrt{b^2 - 4ac}}])/(a^2*\sqrt{b - 2c - \sqrt{b^2 - 4ac}}*\sqrt{b + 2c - \sqrt{b^2 - 4ac}}) + (2bc*(1 - (b^2 - 2ac)/(b\sqrt{b^2 - 4ac}))*\operatorname{ArcTan}[(\sqrt{b - 2c + \sqrt{b^2 - 4ac}})*\operatorname{Tan}[x/2])/\sqrt{b + 2c + \sqrt{b^2 - 4ac}}])/(a^2*\sqrt{b - 2c + \sqrt{b^2 - 4ac}}*\sqrt{b + 2c + \sqrt{b^2 - 4ac}}) - (b*\operatorname{ArcTanh}[\operatorname{Sin}[x]])/a^2 + \operatorname{Tan}[x]/a$

#### 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\_)]^(2n\_.)\*(c\_.))^(p\_), x\_Symbol] := Int[ExpandTrig[cos[d + e\*x]^m\*(a + b\*cos[d + e\*x]^n + c\*cos[d + e\*x]^(2n))^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

$$\begin{aligned} \int \frac{\sec^2(x)}{a + b \cos(x) + c \cos^2(x)} dx &= \int \left( \frac{b^2 \left(1 - \frac{ac}{b^2}\right) + bc \cos(x)}{a^2 (a + b \cos(x) + c \cos^2(x))} - \frac{b \sec(x)}{a^2} + \frac{\sec^2(x)}{a} \right) dx \\ &= \frac{\int \frac{b^2 \left(1 - \frac{ac}{b^2}\right) + bc \cos(x)}{a + b \cos(x) + c \cos^2(x)} dx}{a^2} + \frac{\int \sec^2(x) dx}{a} - \frac{b \int \sec(x) dx}{a^2} \\ &= -\frac{b \tanh^{-1}(\sin(x))}{a^2} - \frac{\text{Subst}\left(\int 1 dx, x, -\tan(x)\right)}{a} + \frac{\left(c \left(b - \frac{b^2 - 2ac}{\sqrt{b^2 - 4ac}}\right)\right) \int \frac{1}{b + \sqrt{b^2 - 4ac}}}{a^2} \\ &= -\frac{b \tanh^{-1}(\sin(x))}{a^2} + \frac{\tan(x)}{a} + \frac{\left(2c \left(b - \frac{b^2 - 2ac}{\sqrt{b^2 - 4ac}}\right)\right) \text{Subst}\left(\int \frac{1}{b + 2c + \sqrt{b^2 - 4ac} + (b - 2c)\cos(x)} dx, x, -\tan(x)\right)}{a^2} \\ &= \frac{2c \left(b + \frac{b^2 - 2ac}{\sqrt{b^2 - 4ac}}\right) \tan^{-1}\left(\frac{\sqrt{b - 2c - \sqrt{b^2 - 4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b + 2c - \sqrt{b^2 - 4ac}}}\right)}{a^2 \sqrt{b - 2c - \sqrt{b^2 - 4ac}} \sqrt{b + 2c - \sqrt{b^2 - 4ac}}} + \frac{2c \left(b - \frac{b^2 - 2ac}{\sqrt{b^2 - 4ac}}\right) \tan^{-1}\left(\frac{\sqrt{b - 2c + \sqrt{b^2 - 4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b + 2c + \sqrt{b^2 - 4ac}}}\right)}{a^2 \sqrt{b - 2c + \sqrt{b^2 - 4ac}} \sqrt{b + 2c + \sqrt{b^2 - 4ac}}} \end{aligned}$$

**Mathematica [A]** time = 1.18, size = 348, normalized size = 1.27

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

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
```

$$-4*a*c))*\text{Tan}[x/2])/(\text{Sqrt}[-2*b^2 + 4*c*(a + c) + 2*b*\text{Sqrt}[b^2 - 4*a*c]])/(\text{Sqrt}[b^2 - 4*a*c]*\text{Sqrt}[-b^2 + 2*c*(a + c) + b*\text{Sqrt}[b^2 - 4*a*c]]) + b*\text{Log}[\text{Cos}[x/2] - \text{Sin}[x/2]] - b*\text{Log}[\text{Cos}[x/2] + \text{Sin}[x/2]] + (a*\text{Sin}[x/2])/(\text{Cos}[x/2] - \text{Sin}[x/2]) + (a*\text{Sin}[x/2])/(\text{Cos}[x/2] + \text{Sin}[x/2]))/a^2$$

**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] 
$$\begin{aligned} & -c/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\text{arctanh}((-a+b-c)*\text{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)}*\text{arctan}((a-b+c)*\text{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)}*\text{arctan}((a-b+c)*\text{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)}*\text{arctan}((a-b+c)*\text{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)}*\text{arctanh}((-a+b-c)*\text{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)}*\text{arctan}((a-b+c)*\text{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)}*\text{arctanh}((-a+b-c)*\text{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)}*\text{arctan}((a-b+c)*\text{tan}(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}) \\ & *c^2+b/a^2*\ln(\text{tan}(1/2*x)-1)-b/a^2*\ln(\text{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)}*\text{arctanh}((-a+b-c)*\text{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)}*\text{arctan}((a-b+c)*\text{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)}*\text{arctanh}((-a+b-c)*\text{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)}*\text{arctan}((a-b+c)*\text{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)}*\text{arctanh}((-a+b-c)*\text{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)}*\text{arctan}((a-b+c)*\text{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)}*\text{arctanh}((-a+b-c)*\text{tan}(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}) \end{aligned}$$



$$\begin{aligned} & \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) \right) / \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * c^2 b^2 - 1/a^2 / \left( (-4ac+b^2)^{1/2} / (a-b+c) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) \right) / \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * c^2 b^2 - 2 / \left( (-4ac+b^2)^{1/2} / (a-b+c) \right) / \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * c^2 + 2 / \left( (-4ac+b^2)^{1/2} / (a-b+c) \right) / \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * c^2 - 1/a^2 / (a-b+c) / \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * b^3 - 1/a^2 / (a-b+c) / \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * b^3 + 1/a / (a-b+c) / \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * b^2 - 1/a / (a-b+c) / \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * c^2 - 1/a / (\tan \left( \frac{1}{2}x \right) - 1) - 1/a / (\tan \left( \frac{1}{2}x \right) + 1) + 1/a / \left( (-4ac+b^2)^{1/2} / (a-b+c) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) / \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * b^3 + 1/a / (a-b+c) \\ & \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) / \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * b^2 - 1/a / \left( (-4ac+b^2)^{1/2} / (a-b+c) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) / \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * b^3 + 3c / \left( (-4ac+b^2)^{1/2} / (a-b+c) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) / \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * b^3 * c / \left( (-4ac+b^2)^{1/2} / (a-b+c) \right) \\ & \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) / \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * b^2 + 2/a^2 / (a-b+c) \\ & \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * \operatorname{arctanh} \left( \frac{-a+b-c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) / \left( \left( (-4ac+b^2)^{1/2} - a + c \right) (a-b+c)^{1/2} \right) * c^2 b^2 - 1/a^2 / (a-b+c) \\ & \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * \operatorname{arctan} \left( \frac{a-b+c}{a-b+c} \tan \left( \frac{1}{2}x \right) \right) / \left( \left( (-4ac+b^2)^{1/2} + a - c \right) (a-b+c)^{1/2} \right) * c^2 b \end{aligned}$$

**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]  $\frac{1}{2} * (2 * (a^2 * \cos(2x)^2 + a^2 * \sin(2x)^2 + 2 * a^2 * \cos(2x) + a^2) * \operatorname{integrate}(2 * (2 * b^2 * c * \cos(3x)^2 + 2 * b^2 * c * \cos(x)^2 + 2 * b^2 * c * \sin(3x)^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(2x)^2 + 4 * (2 * a * b^2 - a * c^2 - (2 * a^2 - b^2) * c) * \sin(2x)^2 + 2 * (2 * b^3 + b * c^2) * \sin(2x) * \sin(x) + (b * c^2 * \cos(3x) + b * c^2 * \cos(x) + 2 * (b^2 * c - a * c^2) * \cos(2x)) * \cos(4x) + (4 * b^2 * c * \cos(x) + b * c^2 + 2 * (2 * b^3 + b * c^2) * \cos(2x)) * \cos(3x) + 2 * (b^2 * c - a * c^2 + (2 * b^3 + b * c^2) * \cos(x)) * \cos(2x) + (b * c^2 * \sin(3x) + b * c^2 * \sin(x) + 2 * (b^2 * c - a * c^2) * \sin(2x)) * \sin(4x) + 2 * (2 * b^2 * c * \sin(x) + (2 * b^3 + b * c^2) * \sin(2x)) * \sin(3x)) / (a^2 * c^2 * \cos(4x)^2 + 4 * a^2 * b^2 * \cos(3x)^2 + 4 * a^2 * b^2 * \cos(x)^2 + a^2 * c^2 * \sin(4x)^2 + 4 * a^2 * b^2 * \sin(3x)^2 + 4 * a^2 * b^2 * \sin(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(2x)^2 + 4 * (4 * a^4 + 4 * a^3 * c + a^2 * c^2) * \sin(2x)^2 + 8 * (2 * a^3 * b + a^2 * b * c) * \sin(2x) * \sin(x) + 2 * (2 * a^2 * b * c * \cos(3x) + 2 * a^2 * b * c * \cos(x) + a^2 * c^2 + 2 * (2 * a^3 * c + a^2 * c^2) * \cos(2x)) * \cos(4x) + 4 * (2 * a^2 * b^2 * \cos(x) + a^2 * b * c + 2 * (2 * a^3 * b + a^2 * b * c) * \cos(2x)) * \cos(3x) + 4 * (2 * a^3 * c + a^2 * c^2 + 2 * (2 * a^3 * b + a^2 * b * c) * \cos(x)) * \cos(2x) + 4 * (a^2 * b * c * \sin(3x) + a^2 * b * c * \sin(x) + (2 * a^3 * c + a^2 * c^2) * \sin(2x)) * \sin(4x) + 8 * (a^2 * b^2 * \sin(x) + (2 * a^3 * b + a^2 * b * c) * \sin(2x)) * \sin(3x)), x) - (b * \cos(2x)^2 + b * \sin(2x)^2 + 2 * b * \cos(2x) + b) * \log(\cos(x)^2 + \sin(x)^2 + 2 * \sin(x) + 1) + (b * \cos(2x)^2 + b * \sin(2x)^2 + 2 * b * \cos(2x) + b) * \log(\cos(x)^2 + \sin(x)^2 - 2 * \sin(x) + 1) + 4 * a * \sin(2x)) / (a^2 * \cos(2x)^2 + a^2 * \sin(2x)^2 + 2 * a^2 * \cos(2x) + 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]  $\text{int}(1/(\cos(x)^2*(a + b*\cos(x) + c*\cos(x)^2)),x)$

[Out]  $(b*\text{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 + 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)*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 -$

$$\begin{aligned}
& 8a^8b^2c - 2a^2b^6c^3 + 2a^2b^7c^2 + 14a^3b^4c^4 - 10a^3b^5c^3 - 24a^3b^6c^2 - 27a^4b^2c^5 + 15a^4b^3c^4 + 59a^4b^4c^3 + 7 \\
& *a^4b^5c^2 + 11a^5b^2c^4 - 122a^5b^3c^3 + 93a^5b^4c^2 + 37a^6b^2c^3 - 99a^6b^3c^2 + 23a^7b^2c^2)/a^4)/a^2)/a^2)*i)/a^2)/((1638 \\
& 4*(b*c^7 - 4b^2c^6 + 6b^3c^5 - 4b^4c^4 + b^5c^3 - 2a*b^2c^5 + 2a* \\
& b^3c^4 - a*b^4c^3 + a^2b^2c^4 + a*b*c^6))/a^4 + (b*((8192*\tan(x/2))*(a*b \\
& ^8 + 5b^8c - b^9 + a^2c^7 + a^3c^6 + b^4c^5 - 5b^5c^4 + 10b^6c^3 - \\
& 10b^7c^2 - 2a*b^2c^6 + 14a*b^3c^5 - 35a*b^4c^4 + 40a*b^5c^3 - 20 \\
& *a*b^6c^2 - a^2b*c^6 - 6a^2b^6c + 10a^2b^2c^5 - 20a^2b^3c^4 + 5* \\
& a^2b^4c^3 + 11a^2b^5c^2 + 10a^3b^2c^4 - 18a^3b^3c^3 + 9a^3b^4c^2 - 2a^4b^2c^3 + 2a*b^7c)) \\
& /a^4 + (b*((8192*(6a^2b^8 - 3a*b^9 - 4a^3b^7 + a^4b^6 + 3a^4c^6 + 2a^5c^5 - a^6c^4 + 2a*b^5c^4 - 5a*b^6 \\
& *c^3 + a*b^7c^2 + 16a^2b^7c + 8a^3b*c^6 - 38a^3b^6c + 10a^4b*c^5 \\
& + 23a^4b^5c + 6a^5b*c^4 - 5a^5b^4c - 10a^2b^3c^5 + 25a^2b^4c^4 + 4a^2b^5c^3 - 41a^2b^6c^2 - 20a^3b^2c^5 - 36a^3b^3c^4 + 91* \\
& a^3b^4c^3 - 3a^3b^5c^2 - 24a^4b^2c^4 - 55a^4b^3c^3 + 57a^4b^4c^2 - 3a^5b^2c^3 - 28a^5b^3c^2 + 4a^6b^2c^2 + 5a*b^8c)) \\
& /a^4 + (b*((b*((8192*(3a^5b^7 - 7a^6b^6 + 5a^7b^5 - a^8b^4 + 12a^7c^5 + 20* \\
& a^8c^4 + 4a^9c^3 - 4a^10c^2 - 5a^5b^6c + 8a^6b*c^5 - 15a^6b^5c \\
& + 28a^7b*c^4 + 46a^7b^4c + 64a^8b*c^3 - 31a^8b^3c + 44a^9b*c^2 \\
& + 5a^9b^2c - 2a^5b^3c^4 + 5a^5b^4c^3 - a^5b^5c^2 - 23a^6b^2c^4 - 3a^6b^3c^3 + 40a^6b^4c^2 - 85a^7b^2c^3 - 4a^7b^3c^2 - 73a^ \\
& ^8b^2c^2))/a^4 + (8192*b*\tan(x/2)*(8a^12c + 2a^6b^7 - 6a^7b^6 + 8a^ \\
& ^8b^5 - 8a^9b^4 + 6a^10b^3 - 2a^11b^2 + 24a^8c^5 + 16a^9c^4 - 32 \\
& *a^10c^3 - 16a^11c^2 - 2a^6b^6c - 14a^7b^5c - 8a^8b*c^4 + 46a^8 \\
& *b^4c + 88a^9b*c^3 - 50a^9b^3c + 72a^10b*c^2 + 36a^10b^2c + 2a^ \\
& 6b^4c^3 - 2a^6b^5c^2 - 14a^7b^2c^4 + 10a^7b^3c^3 + 24a^7b^4c^2 \\
& - 68a^8b^2c^3 + 2a^8b^3c^2 - 80a^9b^2c^2 - 24a^11b*c))/a^6))/a \\
& ^2 + (8192*\tan(x/2)*(6a^3b^8 - 2a^2b^9 - 8a^4b^7 + 8a^5b^6 - 6a^6b^ \\
& b^5 + 2a^7b^4 + 10a^5c^6 + 6a^6c^5 - 2a^7c^4 + 2a^8c^3 + 2a^2b^ \\
& 8c + 14a^3b^7c - 50a^4b^6c - 22a^5b*c^5 + 56a^5b^5c + 12a^6b* \\
& c^4 - 38a^6b^4c + 18a^7b*c^3 + 24a^7b^3c - 8a^8b^2c - 2a^2b^6c^ \\
& c^3 + 2a^2b^7c^2 + 14a^3b^4c^4 - 10a^3b^5c^3 - 24a^3b^6c^2 - 27 \\
& *a^4b^2c^5 + 15a^4b^3c^4 + 59a^4b^4c^3 + 7a^4b^5c^2 + 11a^5b^2 \\
& *c^4 - 122a^5b^3c^3 + 93a^5b^4c^2 + 37a^6b^2c^3 - 99a^6b^3c^2 + \\
& 23a^7b^2c^2))/a^4)/a^2)/a^2)/a^2 - (b*((8192*\tan(x/2))*(a*b^8 + 5b^8 \\
& *c - b^9 + a^2c^7 + a^3c^6 + b^4c^5 - 5b^5c^4 + 10b^6c^3 - 10b^7c^2 \\
& - 2a*b^2c^6 + 14a*b^3c^5 - 35a*b^4c^4 + 40a*b^5c^3 - 20a*b^6c^2 \\
& - a^2b*c^6 - 6a^2b^6c + 10a^2b^2c^5 - 20a^2b^3c^4 + 5a^2b^4c^3 \\
& + 11a^2b^5c^2 + 10a^3b^2c^4 - 18a^3b^3c^3 + 9a^3b^4c^2 - 2a^4 \\
& b^2c^3 + 2a*b^7c))/a^4 - (b*((8192*(6a^2b^8 - 3a*b^9 - 4a^3b^7 + \\
& a^4b^6 + 3a^4c^6 + 2a^5c^5 - a^6c^4 + 2a*b^5c^4 - 5a*b^6c^3 + a*b \\
& ^7c^2 + 16a^2b^7c + 8a^3b*c^6 - 38a^3b^6c + 10a^4b*c^5 + 23a^4* \\
& b^5c + 6a^5b*c^4 - 5a^5b^4c - 10a^2b^3c^5 + 25a^2b^4c^4 + 4a^2 \\
& *b^5c^3 - 41a^2b^6c^2 - 20a^3b^2c^5 - 36a^3b^3c^4 + 91a^3b^4c^ \\
& 3 - 3a^3b^5c^2 - 24a^4b^2c^4 - 55a^4b^3c^3 + 57a^4b^4c^2 - 3a^ \\
& 5b^2c^3 - 28a^5b^3c^2 + 4a^6b^2c^2 + 5a*b^8c))/a^4 + (b*((b*((819 \\
& 2*(3a^5b^7 - 7a^6b^6 + 5a^7b^5 - a^8b^4 + 12a^7c^5 + 20a^8c^4 + \\
& 4a^9c^3 - 4a^10c^2 - 5a^5b^6c + 8a^6b*c^5 - 15a^6b^5c + 28a^7* \\
& b*c^4 + 46a^7b^4c + 64a^8b*c^3 - 31a^8b^3c + 44a^9b*c^2 + 5a^9b \\
& ^2c - 2a^5b^3c^4 + 5a^5b^4c^3 - a^5b^5c^2 - 23a^6b^2c^4 - 3a^6 \\
& *b^3c^3 + 40a^6b^4c^2 - 85a^7b^2c^3 - 4a^7b^3c^2 - 73a^8b^2c^2 \\
& ))/a^4 - (8192*b*\tan(x/2)*(8a^12c + 2a^6b^7 - 6a^7b^6 + 8a^8b^5 - 8 \\
& *a^9b^4 + 6a^10b^3 - 2a^11b^2 + 24a^8c^5 + 16a^9c^4 - 32a^10c^3 \\
& - 16a^11c^2 - 2a^6b^6c - 14a^7b^5c - 8a^8b*c^4 + 46a^8b^4c + 8 \\
& 8a^9b*c^3 - 50a^9b^3c + 72a^10b*c^2 + 36a^10b^2c + 2a^6b^4c^3 \\
& - 2a^6b^5c^2 - 14a^7b^2c^4 + 10a^7b^3c^3 + 24a^7b^4c^2 - 68a^8 \\
& *b^2c^3 + 2a^8b^3c^2 - 80a^9b^2c^2 - 24a^11b*c))/a^6))/a^2 - (8192 \\
& *\tan(x/2)*(6a^3b^8 - 2a^2b^9 - 8a^4b^7 + 8a^5b^6 - 6a^6b^5 + 2a^
\end{aligned}$$

$$\begin{aligned}
& 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^5*c + 56*a^5*b^5*c + 12*a^6*b^4*c - 38*a^6*b^4*c + 18*a^7*b^3*c + 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 - \operatorname{atan}(\frac{(((((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^5*c - 15*a^6*b^5*c + 28*a^7*b^4*c + 46*a^7*b^4*c + 64*a^8*b^3*c - 31*a^8*b^3*c + 44*a^9*b^2*c + 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^4*c + 46*a^8*b^4*c + 88*a^9*b^3*c - 50*a^9*b^3*c + 72*a^10*b^2*c + 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^5*c + 56*a^5*b^5*c + 12*a^6*b^4*c - 38*a^6*b^4*c + 18*a^7*b^3*c + 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^6*c - 38*a^3*b^6*c + 10*a^4*b^5*c + 23*a^4*b^5*c + 6*a^5*b^4*c - 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^6*c - 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^
\end{aligned}$$

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

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

$$\begin{aligned}
& ^2c^4 - 18a^3b^3c^3 + 9a^3b^4c^2 - 2a^4b^2c^3 + 2a^5b^7c)) / a^4) * \\
& (- (b^8 + 8a^3c^5 + 8a^4c^4 - b^5(- (4ac - b^2)^3)^{1/2} - b^6c^2 + 8 \\
& * a^2b^4c^3 - 18a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + b^3c^2(- (4ac - b^2)^3)^{1/2} - \\
& 10a^2b^6c - 3a^2b^2c^2(- (4ac - b^2)^3)^{1/2} - \\
& 2a^2b^3c^3(- (4ac - b^2)^3)^{1/2} + 4a^2b^3c^3(- (4ac - b^2)^3)^{1/2}) / ( \\
& 2(a^6b^4 - a^4b^6 + 16a^6c^4 + 32a^7c^3 + 16a^8c^2 + 10a^5b^4c \\
& - 8a^7b^2c + a^4b^4c^2 - 8a^5b^2c^3 - 32a^6b^2c^2))^{1/2} + ((( \\
& ((8192(3a^5b^7 - 7a^6b^6 + 5a^7b^5 - a^8b^4 + 12a^7c^5 + 20a^8c \\
& ^4 + 4a^9c^3 - 4a^{10}c^2 - 5a^5b^6c + 8a^6b^5c^5 - 15a^6b^5c^4 + 28 \\
& * a^7b^4c^4 + 46a^7b^4c^3 + 64a^8b^3c^3 - 31a^8b^3c^2 + 44a^9b^2c^2 + 5 \\
& a^9b^2c - 2a^5b^3c^4 + 5a^5b^4c^3 - a^5b^5c^2 - 23a^6b^2c^4 - \\
& 3a^6b^3c^3 + 40a^6b^4c^2 - 85a^7b^2c^3 - 4a^7b^3c^2 - 73a^8b^2 \\
& c^2)) / a^4 + (8192 \tan(x/2) * (- (b^8 + 8a^3c^5 + 8a^4c^4 - b^5(- (4ac - b^2)^3)^{1/2} - b^6c^2 + 8 \\
& * a^2b^4c^3 - 18a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + b^3c^2(- (4ac - b^2)^3)^{1/2} - 10a^2b^6c - 3a^2b^2c^2(- (4ac - b^2)^3)^{1/2} - \\
& 2a^2b^3c^3(- (4ac - b^2)^3)^{1/2} + 4a^2b^3c^3(- (4ac - b^2)^3)^{1/2}) / (2(a^6b^4 - a^4b^6 + 16a^6c^4 + 32a^7c^3 \\
& + 16a^8c^2 + 10a^5b^4c - 8a^7b^2c + a^4b^4c^2 - 8a^5b^2c^3 - \\
& 32a^6b^2c^2))^{1/2} * (8a^{12}c + 2a^6b^7 - 6a^7b^6 + 8a^8b^5 - 8a \\
& ^9b^4 + 6a^{10}b^3 - 2a^{11}b^2 + 24a^8c^5 + 16a^9c^4 - 32a^{10}c^3 - \\
& 16a^{11}c^2 - 2a^6b^6c - 14a^7b^5c - 8a^8b^4c + 46a^8b^4c + 88 \\
& a^9b^3c - 50a^9b^3c + 72a^{10}b^2c^2 + 36a^{10}b^2c + 2a^6b^4c^3 - \\
& 2a^6b^5c^2 - 14a^7b^2c^4 + 10a^7b^3c^3 + 24a^7b^4c^2 - 68a^8b^2 \\
& c^3 + 2a^8b^3c^2 - 80a^9b^2c^2 - 24a^{11}b^2c)) / a^4) * (- (b^8 + 8a^3 \\
& * c^5 + 8a^4c^4 - b^5(- (4ac - b^2)^3)^{1/2} - b^6c^2 + 8a^2b^4c^3 - 1 \\
& 8a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + b^3c^2(- (4ac - b^2)^3)^{1/2} - 10a^2b^6c - 3a^2b^2c^2(- (4ac - b^2)^3)^{1/2} - \\
& 2a^2b^3c^3(- (4ac - b^2)^3)^{1/2} + 4a^2b^3c^3(- (4ac - b^2)^3)^{1/2}) / (2(a^6b^4 - a \\
& ^4b^6 + 16a^6c^4 + 32a^7c^3 + 16a^8c^2 + 10a^5b^4c - 8a^7b^2c \\
& + a^4b^4c^2 - 8a^5b^2c^3 - 32a^6b^2c^2))^{1/2} + (8192 \tan(x/2) * (6 \\
& * a^3b^8 - 2a^2b^9 - 8a^4b^7 + 8a^5b^6 - 6a^6b^5 + 2a^7b^4 + 10a \\
& ^5c^6 + 6a^6c^5 - 2a^7c^4 + 2a^8c^3 + 2a^2b^8c + 14a^3b^7c - 5 \\
& 0a^4b^6c - 22a^5b^5c + 56a^5b^5c + 12a^6b^4c - 38a^6b^4c + 1 \\
& 8a^7b^3c + 24a^7b^3c - 8a^8b^2c - 2a^2b^6c^3 + 2a^2b^7c^2 + \\
& 14a^3b^4c^4 - 10a^3b^5c^3 - 24a^3b^6c^2 - 27a^4b^2c^5 + 15a^4 \\
& b^3c^4 + 59a^4b^4c^3 + 7a^4b^5c^2 + 11a^5b^2c^4 - 122a^5b^3c^3 \\
& + 93a^5b^4c^2 + 37a^6b^2c^3 - 99a^6b^3c^2 + 23a^7b^2c^2)) / a^4) \\
& * (- (b^8 + 8a^3c^5 + 8a^4c^4 - b^5(- (4ac - b^2)^3)^{1/2} - b^6c^2 + \\
& 8a^2b^4c^3 - 18a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + b^3c^2(- (4ac - b^2)^3)^{1/2} - 10a^2b^6c - 3a^2b^2c^2(- (4ac - b^2)^3)^{1/2} - \\
& 2a^2b^3c^3(- (4ac - b^2)^3)^{1/2} + 4a^2b^3c^3(- (4ac - b^2)^3)^{1/2}) / \\
& (2(a^6b^4 - a^4b^6 + 16a^6c^4 + 32a^7c^3 + 16a^8c^2 + 10a^5b^4c \\
& - 8a^7b^2c + a^4b^4c^2 - 8a^5b^2c^3 - 32a^6b^2c^2))^{1/2} + (8 \\
& 192 * (6a^2b^8 - 3a^3b^9 - 4a^3b^7 + a^4b^6 + 3a^4c^6 + 2a^5c^5 - a^ \\
& 6c^4 + 2a^2b^5c^4 - 5a^2b^6c^3 + a^2b^7c^2 + 16a^2b^7c + 8a^3b^6c^6 \\
& - 38a^3b^6c + 10a^4b^5c^5 + 23a^4b^5c + 6a^5b^4c^4 - 5a^5b^4c^3 - \\
& 10a^2b^3c^5 + 25a^2b^4c^4 + 4a^2b^5c^3 - 41a^2b^6c^2 - 20a^3b^2 \\
& c^5 - 36a^3b^3c^4 + 91a^3b^4c^3 - 3a^3b^5c^2 - 24a^4b^2c^4 - \\
& 55a^4b^3c^3 + 57a^4b^4c^2 - 3a^5b^2c^3 - 28a^5b^3c^2 + 4a^6b^2 \\
& c^2 + 5a^2b^8c)) / a^4) * (- (b^8 + 8a^3c^5 + 8a^4c^4 - b^5(- (4ac - b \\
& ^2)^3)^{1/2} - b^6c^2 + 8a^2b^4c^3 - 18a^2b^2c^4 + 33a^2b^4c^2 - 38 \\
& * a^3b^2c^3 + b^3c^2(- (4ac - b^2)^3)^{1/2} - 10a^2b^6c - 3a^2b^2c^2(- (4ac - b^2)^3)^{1/2} - 2a^2b^3c^3(- (4ac - b^2)^3)^{1/2} + 4a^2b^3c^3(- (4ac - b^2)^3)^{1/2}) / (2(a^6b^4 - a^4b^6 + 16a^6c^4 + 32a^7c^3 + \\
& 16a^8c^2 + 10a^5b^4c - 8a^7b^2c + a^4b^4c^2 - 8a^5b^2c^3 - 32 \\
& a^6b^2c^2))^{1/2} + (8192 \tan(x/2) * (a^8b^8 + 5b^8c - b^9 + a^2c^7 + a^ \\
& 3c^6 + b^4c^5 - 5b^5c^4 + 10b^6c^3 - 10b^7c^2 - 2a^2b^2c^6 + 14a^ \\
& b^3c^5 - 35a^2b^4c^4 + 40a^2b^5c^3 - 20a^2b^6c^2 - a^2b^6c^6 - 6a^2b^ \\
& 6c + 10a^2b^2c^5 - 20a^2b^3c^4 + 5a^2b^4c^3 + 11a^2b^5c^2 + 10
\end{aligned}$$

$$\begin{aligned}
& *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 - \operatorname{atan}(\left(\left(\left(\left(8192\right.\right.\right.\right. \\
& *(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
\end{aligned}$$



$$\begin{aligned}
& ^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 \\
& ^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 -
\end{aligned}$$

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

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

```

3*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 + 1
1*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)

$$3.20 \quad \int \frac{\sec^3(x)}{a+b \cos(x)+c \cos^2(x)} dx$$

Optimal. Leaf size=334

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

[Out]  $1/2 \cdot \operatorname{arctanh}(\sin(x)) / a + (-a \cdot c + b^2) \cdot \operatorname{arctanh}(\sin(x)) / a^3 - 2 \cdot c \cdot \operatorname{arctan}((b - 2 \cdot c - (-4 \cdot a \cdot c + b^2)^{1/2})^{1/2} \cdot \tan(1/2 \cdot x) / (b + 2 \cdot c - (-4 \cdot a \cdot c + b^2)^{1/2})^{1/2}) \cdot (b^3 - 3 \cdot a \cdot b \cdot c + (-a \cdot c + b^2) \cdot (-4 \cdot a \cdot c + b^2)^{1/2}) / a^3 / (-4 \cdot a \cdot c + b^2)^{1/2} / (b - 2 \cdot c - (-4 \cdot a \cdot c + b^2)^{1/2})^{1/2} / (b + 2 \cdot c - (-4 \cdot a \cdot c + b^2)^{1/2})^{1/2} + 2 \cdot c \cdot \operatorname{arctan}((b - 2 \cdot c + (-4 \cdot a \cdot c + b^2)^{1/2})^{1/2} \cdot \tan(1/2 \cdot x) / (b + 2 \cdot c + (-4 \cdot a \cdot c + b^2)^{1/2})^{1/2}) \cdot (b^3 - 3 \cdot a \cdot b \cdot c - (-a \cdot c + b^2) \cdot (-4 \cdot a \cdot c + b^2)^{1/2}) / a^3 / (-4 \cdot a \cdot c + b^2)^{1/2} / (b - 2 \cdot c + (-4 \cdot a \cdot c + b^2)^{1/2})^{1/2} / (b + 2 \cdot c + (-4 \cdot a \cdot c + b^2)^{1/2})^{1/2} - b \cdot \tan(x) / a^2 + 1/2 \cdot \sec(x) \cdot \tan(x) / a$

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}

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

Antiderivative was successfully verified.

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

[Out]  $(-2 \cdot c \cdot (b^3 - 3 \cdot a \cdot b \cdot c + \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c] \cdot (b^2 - a \cdot c)) \cdot \operatorname{ArcTan}[(\operatorname{Sqrt}[b - 2 \cdot c - \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c]] \cdot \operatorname{Tan}[x/2]) / \operatorname{Sqrt}[b + 2 \cdot c - \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c]])] / (a^3 \cdot \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c] \cdot \operatorname{Sqrt}[b - 2 \cdot c - \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c]] \cdot \operatorname{Sqrt}[b + 2 \cdot c - \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c]]) + (2 \cdot c \cdot (b^3 - 3 \cdot a \cdot b \cdot c - \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c] \cdot (b^2 - a \cdot c)) \cdot \operatorname{ArcTan}[(\operatorname{Sqrt}[b - 2 \cdot c + \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c]] \cdot \operatorname{Tan}[x/2]) / \operatorname{Sqrt}[b + 2 \cdot c + \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c]])] / (a^3 \cdot \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c] \cdot \operatorname{Sqrt}[b - 2 \cdot c + \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c]] \cdot \operatorname{Sqrt}[b + 2 \cdot c + \operatorname{Sqrt}[b^2 - 4 \cdot a \cdot c]]) + \operatorname{ArcTanh}[\operatorname{Sin}[x]] / (2 \cdot a) + ((b^2 - a \cdot c) \cdot \operatorname{ArcTanh}[\operatorname{Sin}[x]]) / a^3 - (b \cdot \operatorname{Tan}[x]) / a^2 + (\operatorname{Sec}[x] \cdot \operatorname{Tan}[x]) / (2 \cdot a)$

### 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[ExpandTrig[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] && IntegersQ[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[ExpandIntegrand[(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), Int[(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

$$\begin{aligned} \int \frac{\sec^3(x)}{a + b \cos(x) + c \cos^2(x)} dx &= \int \left( \frac{-b^3 \left(1 - \frac{2ac}{b^2}\right) - b^2 c \left(1 - \frac{ac}{b^2}\right) \cos(x)}{a^3 (a + b \cos(x) + c \cos^2(x))} + \frac{(b^2 - ac) \sec(x)}{a^3} - \frac{b \sec^2(x)}{a^2} + \frac{\sec^3(x)}{a} \right) dx \\ &= \frac{\int \frac{-b^3 \left(1 - \frac{2ac}{b^2}\right) - b^2 c \left(1 - \frac{ac}{b^2}\right) \cos(x)}{a + b \cos(x) + c \cos^2(x)} dx}{a^3} + \frac{\int \sec^3(x) dx}{a} - \frac{b \int \sec^2(x) dx}{a^2} + \frac{(b^2 - ac) \int \sec(x) dx}{a^3} \\ &= \frac{(b^2 - ac) \tanh^{-1}(\sin(x))}{a^3} + \frac{\sec(x) \tan(x)}{2a} + \frac{\int \sec(x) dx}{2a} + \frac{b \operatorname{Subst}(\int 1 dx, x, -\tan(x))}{a^2} \\ &= \frac{\tanh^{-1}(\sin(x))}{2a} + \frac{(b^2 - ac) \tanh^{-1}(\sin(x))}{a^3} - \frac{b \tan(x)}{a^2} + \frac{\sec(x) \tan(x)}{2a} + \frac{(2c(b^2 - ac) \tan(x) - b^3 + 3abc)}{a^3} \\ &= -\frac{2c(b^3 - 3abc + \sqrt{b^2 - 4ac}(b^2 - ac)) \tan^{-1}\left(\frac{\sqrt{b-2c-\sqrt{b^2-4ac}} \tan\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{b^2-4ac}}}\right)}{a^3 \sqrt{b^2 - 4ac} \sqrt{b - 2c - \sqrt{b^2 - 4ac}} \sqrt{b + 2c - \sqrt{b^2 - 4ac}}} + \frac{2c(b^3 - 3abc)}{a^3 \sqrt{b^2 - 4ac}} \end{aligned}$$

**Mathematica [A]** time = 3.07, size = 446, normalized size = 1.34

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

Antiderivative was successfully verified.

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

[Out] 
$$-1/4*((4*\text{Sqrt}[2]*c*(b^3 - 3*a*b*c - b^2*\text{Sqrt}[b^2 - 4*a*c] + a*c*\text{Sqrt}[b^2 - 4*a*c])*\text{ArcTanh}(((b - 2*c + \text{Sqrt}[b^2 - 4*a*c])*\text{Tan}[x/2])/(\text{Sqrt}[b^2 - 4*a*c]*\text{Sqrt}[-b^2 + 2*c*(a + c) - b*\text{Sqrt}[b^2 - 4*a*c]]))/(\text{Sqrt}[b^2 - 4*a*c]*\text{Sqrt}[-b^2 + 2*c*(a + c) - b*\text{Sqrt}[b^2 - 4*a*c]])) + (4*\text{Sqrt}[2]*c*(b^3 - 3*a*b*c + b^2*\text{Sqrt}[b^2 - 4*a*c] - a*c*\text{Sqrt}[b^2 - 4*a*c])*\text{ArcTanh}((-b + 2*c + \text{Sqrt}[b^2 - 4*a*c])*\text{Tan}[x/2])/(\text{Sqrt}[-2*b^2 + 4*c*(a + c) + 2*b*\text{Sqrt}[b^2 - 4*a*c]]))/(\text{Sqrt}[b^2 - 4*a*c]*\text{Sqrt}[-b^2 + 2*c*(a + c) + b*\text{Sqrt}[b^2 - 4*a*c]]) + 2*(a^2 + 2*b^2 - 2*a*c)*\text{Log}[\text{Cos}[x/2] - \text{Sin}[x/2]] - 2*(a^2 + 2*b^2 - 2*a*c)*\text{Log}[\text{Cos}[x/2] + \text{Sin}[x/2]] + (4*a*b*\text{Sin}[x/2])/(\text{Cos}[x/2] - \text{Sin}[x/2]) + a^2/(\text{Cos}[x/2] + \text{Sin}[x/2])^2 + (4*a*b*\text{Sin}[x/2])/(\text{Cos}[x/2] + \text{Sin}[x/2]) + a^2/(-1 + \text{Sin}[x]))/a^3$$

**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] 
$$1/a^3/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*c^2*b^2-2/a^3/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*b^5+1/a^3/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*b^5+1/a^3/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan h((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*c^2*b^2-2/a^3/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctan h((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*b^3-1/a^3/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctan h((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*b^5+1/a^2/(tan(1/2*x)-1)*b+1/a^2*ln(tan(1/2*x)-1)*c-1/a^3*ln(tan(1/2*x)-1)*b^2+1/a^2/(($$

$$\begin{aligned}
& \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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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)}*\operatorname{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
\end{aligned}$$



$$\frac{\arctan\left(\frac{1}{2}x+1\right)+2ab/(a-b+c)/\left(\left(-4ac+b^2\right)^{1/2}-a+c\right)(a-b+c)^{1/2}\operatorname{arctanh}\left(\frac{-a+b-c}{\left(-4ac+b^2\right)^{1/2}-a+c}\right)\tan\left(\frac{1}{2}x\right)/\left(\left(-4ac+b^2\right)^{1/2}-a+c\right)(a-b+c)^{1/2}+2ab/(a-b+c)/\left(\left(-4ac+b^2\right)^{1/2}+a-c\right)(a-b+c)^{1/2}\operatorname{arctan}\left(\frac{a-b+c}{\left(-4ac+b^2\right)^{1/2}+a-c}\right)\tan\left(\frac{1}{2}x\right)/\left(\left(-4ac+b^2\right)^{1/2}+a-c\right)(a-b+c)^{1/2}-1/a^2/(a-b+c)/\left(\left(-4ac+b^2\right)^{1/2}-a+c\right)(a-b+c)^{1/2}\operatorname{arctanh}\left(\frac{-a+b-c}{\left(-4ac+b^2\right)^{1/2}-a+c}\right)\tan\left(\frac{1}{2}x\right)/\left(\left(-4ac+b^2\right)^{1/2}-a+c\right)(a-b+c)^{1/2}+cb^2+3/a^2/(a-b+c)/\left(\left(-4ac+b^2\right)^{1/2}+a-c\right)(a-b+c)^{1/2}\operatorname{arctan}\left(\frac{a-b+c}{\left(-4ac+b^2\right)^{1/2}+a-c}\right)\tan\left(\frac{1}{2}x\right)/\left(\left(-4ac+b^2\right)^{1/2}+a-c\right)(a-b+c)^{1/2}\right)c^2b$$

**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] 
$$\begin{aligned} & -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))*\operatorname{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))*\sin(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)) \end{aligned}$$

**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] 
$$\frac{(\tan(x/2)^3(a + 2b))/a^2 + (\tan(x/2)(a - 2b))/a^2}{(\tan(x/2)^4 - 2\tan(x/2)^2 + 1) - \operatorname{atan}\left(\frac{(2048(26a^9b^7 - 12a^8b^8 - 18a^{10}b^6 + 6a^{11}b^5 - 2a^{12}b^4 + 48a^{10}c^6 + 176a^{11}c^5 + 176a^{12}c^4 + 16a^{13}c^3 - 32a^{14}c^2 + 20a^8b^7c + 74a^9b^6c - 144a^{10}b^5c - 192a^{10}b^5c - 352a^{11}b^4c + 122a^{11}b^4c - 144a^{12}b^3c - 40a^{12}b^3c + 64a^{13}b^2c + 16a^{13}b^2c + 8a^8b^4c^4 - 20a^8b^5c^3 + 4a^8b^6c^2 - 44a^9b^2c^5 + 116a^9b^3c^4 + 10a^9b^4c^3 - 182a^9b^5c^2 - 148a^{10}b^2c^4 + 496a^{10}b^3c^3 - 50a^{10}b^4c^2 - 260a^{11}b^2c^3 + 388a^{11}b^3c^2 - 204a^{12}b^2c^2))}{a^8} - (2048\tan(x/2)\left((8a^4c^6 - b^{10} + 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} + b^8c^2 - 10ab^6c^3 + 33a^2b^4c^4 - 52a^2b^6c^2 - 38a^3b^2c^5 + 96a^3b^4c^3 - 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} + 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^4c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c(-4ac - b^2)^3)^{1/2}\right)}{(2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2}}(32a^{16}c + 8a^{10}b^7 - 24a^{11}b^6 + 32a^{12}b^5 - 32a^{13}b^4 + 24a^{14}b^3 - 8a^{15}b^2 + 96a^{12}c^5 + 64a^{13}c^4 - 128a^{14}c^3 - 64a^{15}c^2 - 8a^{10}b^6c - 56a^{11}b^5c - 32a^{12}b^4c + 184a^{12}b^4c + 352a^{13}b^3c - 200a^{13}b^3c + 288a^{14}b^2c + 144a^{14}b^2c + 8a^{10}b^4c^3 - 8a^{10}b^5c^2 - 56a^{11}b^2c^4 + 40a^{11}b^3c^3 + 96a^{11}b^4c^2 - 272a^{12}b^2c^3 + 8a^{12}b^3c^2 - 320a^{13}b^2c^2 - 96a^{15}b^3c)))/a^8\left((8a^4c^6 - b^{10} + 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} + b^8c^2 - 10ab^6c^3 + 33a^2b^4c^4 - 52a^2b^6c^2 - 38a^3b^2c^5 + 96a^3b^4c^3 - 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} + 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^4c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c(-4ac - b^2)^3)^{1/2}\right)}{(2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2}} + (2048\tan(x/2)\left((8a^{14}c + 8a^4b^{11} - 24a^5b^{10} + 36a^6b^9 - 52a^7b^8 + 61a^8b^7 - 49a^9b^6 + 33a^{10}b^5 - 17a^{11}b^4 + 6a^{12}b^3 - 2a^{13}b^2 + 72a^8c^7 - 136a^9c^6 - 192a^{10}c^5 + 168a^{11}c^4 + 80a^{12}c^3 - 64a^{13}c^2 - 8a^4b^{10}c - 72a^5b^9c + 244a^6b^8c - 308a^7b^7c - 88a^8b^6c + 375a^8b^6c + 496a^9b^5c - 416a^9b^5c - 16a^{10}b^4c + 295a^{10}b^4c - 328a^{11}b^3c - 178a^{11}b^3c + 184a^{12}b^2c + 84a^{12}b^2c + 8a^4b^8c^3 - 8a^4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 + 220a^6b^4c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 + 192a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + 64a^8b^2c^5 - 1152a^8b^3c^4 + 521a^8b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4c^2 + 180a^{10}b^2c^3 + 770a^{10}b^3c^2 - 416a^{11}b^2c^2 - 24a^{13}b^3c)))/a^8\left((8a^4c^6 - b^{10} + 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} + b^8c^2 - 10ab^6c^3 + 33a^2b^4c^4 - 52a^2b^6c^2 - 38a^3b^2c^5 + 96a^3b^4c^3 - 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} + 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^4c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c(-4ac - b^2)^3)^{1/2}\right)}{(2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2}} - (2048(26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b^9c + 251a^5b^8c - 96a^6b^7c - 238a^6b^7c - 200a^7b^6c + 154a^7b^6c + 100a^8b^5c - 72a^8b^5c + 112a^9b^4c + 27a^9b^4c - 68a^{10}b^3c - 6a^{10}b^3c + 8a^{11}b^2c + 8a^2b^8c^4 - 20a^2b^9c^3 + 4a^2b^{10}c^2 - 60a^3b^6c^5 + 156a^3b^7c^4 + 2a^3b^8c^3 - 222a^3b^9c^2 + 136a^4b^4c^6 - 388a^4b^5c^5 - 152a^4b^6c^4 + 856a^4b^7c^3 - 202a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5b^4c^5 - 1362a^5b^5c^4$$

$$\begin{aligned}
& - 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 \\
& 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 \\
& 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)*i - ( \\
& (((((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/
\end{aligned}$$

$$\begin{aligned}
& 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 \\
& ^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 \\
& ^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 + 4 \\
& 0*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 + 3 \\
& 20*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
\end{aligned}$$

$$\begin{aligned}
& 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)} * i) / ((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^5 c - 192 a^{10} b^5 c - 352 a^{11} b^4 c^4 + 122 a^{11} b^4 c - 144 a^{12} b^3 c^3 - 40 a^{12} b^3 c + 64 a^{13} b^2 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)} + 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^4 c + 184 a^{12} b^4 c + 352 a^{13} b^3 c^3 - 200 a^{13} b^3 c + 288 a^{14} b^2 c + 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^6 c + 375 a^8 b^6 c + 496 a^9 b^5 c - 416 a^9 b^5 c - 16 a^{10} b^4 c + 295 a^{10} b^4 c - 328 a^{11} b^3 c^3 - 178 a^{11} b^3 c + 184 a^{12} b^2 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
\end{aligned}$$

$$\begin{aligned}
& 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^7*c - 238*a^6* \\
& b^7*c - 200*a^7*b^6*c + 154*a^7*b^6*c + 100*a^8*b^5*c - 72*a^8*b^5*c + 112* \\
& a^9*b^4*c + 27*a^9*b^4*c - 68*a^{10}*b^3*c - 6*a^{10}*b^3*c + 8*a^{11}*b^2*c + 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 + 4 \\
& 0*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 + 3 \\
& 20*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^8*c \\
& - 31*a^4*b^8*c + 168*a^5*b^7*c + 4*a^5*b^7*c + 2*a^6*b^6*c - 8*a^6*b^6*c - \\
& 84*a^7*b^5*c + 26*a^8*b^4*c + 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 + 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)} + (((((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^5*c - 192*a^{10}*b^5*c - 352*a^{11}*b^4*c + 122*a^{11}*b^4*c - 144* \\
& a^{12}*b^3*c - 40*a^{12}*b^3*c + 64*a^{13}*b^2*c + 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^
\end{aligned}$$

$$\begin{aligned}
& 7 - 24a^{11}b^6 + 32a^{12}b^5 - 32a^{13}b^4 + 24a^{14}b^3 - 8a^{15}b^2 + 96 \\
& a^{12}c^5 + 64a^{13}c^4 - 128a^{14}c^3 - 64a^{15}c^2 - 8a^{10}b^6c - 56a^{11} \\
& b^5c - 32a^{12}b^4c + 184a^{12}b^4c + 352a^{13}b^3c^3 - 200a^{13}b^3c \\
& + 288a^{14}b^2c^2 + 144a^{14}b^2c + 8a^{10}b^4c^3 - 8a^{10}b^5c^2 - 56a \\
& ^{11}b^2c^4 + 40a^{11}b^3c^3 + 96a^{11}b^4c^2 - 272a^{12}b^2c^3 + 8a^{12} \\
& b^3c^2 - 320a^{13}b^2c^2 - 96a^{15}b^2c) / a^8 * ((8a^4c^6 - b^{10} + 8a^5 \\
& c^5 - b^7 * (-4ac - b^2)^3)^{1/2} + b^8c^2 - 10ab^6c^3 + 33a^2b^4c^4 \\
& - 52a^2b^6c^2 - 38a^3b^2c^5 + 96a^3b^4c^3 - 66a^4b^2c^4 + b^5 \\
& c^2 * (-4ac - b^2)^3)^{1/2} + 12ab^8c - 4ab^3c^3 * (-4ac - b^2)^3 \\
& )^{1/2} + 3a^2b^4c^4 * (-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3 * (-4ac - b^2 \\
& )^3)^{1/2} - 10a^2b^3c^2 * (-4ac - b^2)^3)^{1/2} + 6ab^5c * (-4ac - \\
& b^2)^3)^{1/2} / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 \\
& + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048 * \tan(x/2) * (8a^{14}c + 8a^4b^{11} - 24a^5b^{10} + 36a^6 \\
& b^9 - 52a^7b^8 + 61a^8b^7 - 49a^9b^6 + 33a^{10}b^5 - 17a^{11}b^4 + 6 \\
& a^{12}b^3 - 2a^{13}b^2 + 72a^8c^7 - 136a^9c^6 - 192a^{10}c^5 + 168a^{11} \\
& c^4 + 80a^{12}c^3 - 64a^{13}c^2 - 8a^4b^{10}c - 72a^5b^9c + 244a^6b^8 \\
& c - 308a^7b^7c - 88a^8b^6c + 375a^8b^6c + 496a^9b^5c - 416a^9 \\
& b^5c - 16a^{10}b^4c + 295a^{10}b^4c - 328a^{11}b^3c^3 - 178a^{11}b^3c \\
& + 184a^{12}b^2c^2 + 84a^{12}b^2c + 8a^4b^8c^3 - 8a^4b^9c^2 - 72a^5b^6 \\
& c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 + 220a^6b^4c^5 - 140a^6b^5c^4 \\
& - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 + 192a^7b^3c^5 + \\
& 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + 64a^8b^2c^5 - 115 \\
& 2a^8b^3c^4 + 521a^8b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9 \\
& b^3c^3 - 723a^9b^4c^2 + 180a^{10}b^2c^3 + 770a^{10}b^3c^2 - 416a^{11} \\
& b^2c^2 - 24a^{13}b^2c) / a^8 * ((8a^4c^6 - b^{10} + 8a^5c^5 - b^7 * (-4ac \\
& - b^2)^3)^{1/2} + b^8c^2 - 10ab^6c^3 + 33a^2b^4c^4 - 52a^2b^6c^2 \\
& - 38a^3b^2c^5 + 96a^3b^4c^3 - 66a^4b^2c^4 + b^5c^2 * (-4ac - \\
& b^2)^3)^{1/2} + 12ab^8c - 4ab^3c^3 * (-4ac - b^2)^3)^{1/2} + 3a^2b \\
& c^4 * (-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3 * (-4ac - b^2)^3)^{1/2} - 10a \\
& ^2b^3c^2 * (-4ac - b^2)^3)^{1/2} + 6ab^5c * (-4ac - b^2)^3)^{1/2} / ( \\
& 2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c \\
& - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2 \\
& 048 * (26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10 \\
& a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9 \\
& c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4 \\
& b^9c + 251a^5b^8c - 96a^6b^7c - 238a^6b^7c - 200a^7b^6c^6 + 1 \\
& 54a^7b^6c + 100a^8b^5c - 72a^8b^5c + 112a^9b^4c^4 + 27a^9b^4c \\
& - 68a^{10}b^3c^3 - 6a^{10}b^3c + 8a^{11}b^2c^2 + 8a^2b^8c^4 - 20a^2b^9c^3 \\
& + 4a^2b^{10}c^2 - 60a^3b^6c^5 + 156a^3b^7c^4 + 2a^3b^8c^3 - 2 \\
& 22a^3b^9c^2 + 136a^4b^4c^6 - 388a^4b^5c^5 - 152a^4b^6c^4 + 856a^4 \\
& b^7c^3 - 202a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5 \\
& b^4c^5 - 1362a^5b^5c^4 - 115a^5b^6c^3 + 635a^5b^7c^2 - 340a^6b^2 \\
& c^6 + 904a^6b^3c^5 + 583a^6b^4c^4 - 564a^6b^5c^3 - 655a^6b^6c^2 \\
& - 399a^7b^2c^5 + 9a^7b^3c^4 + 536a^7b^4c^3 + 612a^7b^5c^2 - \\
& 37a^8b^2c^4 - 524a^8b^3c^3 - 354a^8b^4c^2 + 239a^9b^2c^3 + 145 \\
& a^9b^3c^2 - 47a^{10}b^2c^2) / a^8 * ((8a^4c^6 - b^{10} + 8a^5c^5 - b^7 * \\
& (-4ac - b^2)^3)^{1/2} + b^8c^2 - 10ab^6c^3 + 33a^2b^4c^4 - 52a^2 \\
& b^6c^2 - 38a^3b^2c^5 + 96a^3b^4c^3 - 66a^4b^2c^4 + b^5c^2 * (-4a \\
& ac - b^2)^3)^{1/2} + 12ab^8c - 4ab^3c^3 * (-4ac - b^2)^3)^{1/2} + 3 \\
& a^2b^4c^4 * (-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3 * (-4ac - b^2)^3)^{1/2} \\
& - 10a^2b^3c^2 * (-4ac - b^2)^3)^{1/2} + 6ab^5c * (-4ac - b^2)^3)^{1/2} / ( \\
& 2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7 \\
& b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} + (2048 * \tan(x/2) * (4ab^{12} + 20b^{12}c - 4b^{13} - 4a^2b^{11} + 4a^3b^{10} \\
& - a^4b^9 + a^5b^8 + 12a^4c^9 - 44a^5c^8 + 2a^6c^7 + 38a^7c^6 - 1 \\
& 8a^8c^5 + 2a^9c^4 + 4b^8c^5 - 20b^9c^4 + 40b^{10}c^3 - 40b^{11}c^2 \\
& - 24ab^6c^6 + 136ab^7c^5 - 300ab^8c^4 + 320ab^9c^3 - 160ab^{10} \\
& c^2 - 20a^2b^{10}c + 20a^3b^9c - 92a^4b^8c - 31a^4b^8c + 168a^5
\end{aligned}$$

$$\begin{aligned}
& *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 + 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
\end{aligned}$$



$$\begin{aligned}
& - 8a^4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 + 220a^6b^4c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 + 192a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + 64a^8b^2c^5 - 1152a^8b^3c^4 + 521a^8b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4c^2 + 180a^{10}b^2c^3 + 770a^{10}b^3c^2 - 416a^{11}b^2c^2 - 24a^{13}b^3c) / a^8 * (- (b^{10} - 8a^4c^6 - 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^3c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c(-4ac - b^2)^3)^{1/2}) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048(26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b^9c + 251a^5b^8c - 96a^6b^7c - 238a^6b^7c - 200a^7b^6c + 154a^7b^6c + 100a^8b^5c - 72a^8b^5c + 112a^9b^4c + 27a^9b^4c - 68a^{10}b^3c - 6a^{10}b^3c + 8a^{11}b^2c + 8a^2b^8c^4 - 20a^2b^9c^3 + 4a^2b^{10}c^2 - 60a^3b^6c^5 + 156a^3b^7c^4 + 2a^3b^8c^3 - 222a^3b^9c^2 + 136a^4b^4c^6 - 388a^4b^5c^5 - 152a^4b^6c^4 + 856a^4b^7c^3 - 202a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5b^4c^5 - 1362a^5b^5c^4 - 115a^5b^6c^3 + 635a^5b^7c^2 - 340a^6b^2c^6 + 904a^6b^3c^5 + 583a^6b^4c^4 - 564a^6b^5c^3 - 655a^6b^6c^2 - 399a^7b^2c^5 + 9a^7b^3c^4 + 536a^7b^4c^3 + 612a^7b^5c^2 - 37a^8b^2c^4 - 524a^8b^3c^3 - 354a^8b^4c^2 + 239a^9b^2c^3 + 145a^9b^3c^2 - 47a^{10}b^2c^2) / a^8 * (- (b^{10} - 8a^4c^6 - 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^3c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c(-4ac - b^2)^3)^{1/2}) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048 \tan(x/2) (4ab^{12} + 20b^{12}c - 4b^{13} - 4a^2b^{11} + 4a^3b^{10} - a^4b^9 + a^5b^8 + 12a^4c^9 - 44a^5c^8 + 2a^6c^7 + 38a^7c^6 - 18a^8c^5 + 2a^9c^4 + 4b^8c^5 - 20b^9c^4 + 40b^{10}c^3 - 40b^{11}c^2 - 24ab^6c^6 + 136ab^7c^5 - 300ab^8c^4 + 320ab^9c^3 - 160ab^{10}c^2 - 20a^2b^{10}c + 20a^3b^9c - 92a^4b^8c - 31a^4b^8c + 168a^5b^7c + 4a^5b^7c + 2a^6b^6c - 8a^6b^6c - 84a^7b^5c + 26a^8b^4c + 44a^2b^4c^7 - 300a^2b^5c^6 + 764a^2b^6c^5 - 900a^2b^7c^4 + 460a^2b^8c^3 - 44a^2b^9c^2 - 32a^3b^2c^8 + 272a^3b^3c^7 - 840a^3b^4c^6 + 1156a^3b^5c^5 - 660a^3b^6c^4 + 72a^3b^7c^3 + 8a^3b^8c^2 + 384a^4b^2c^7 - 704a^4b^3c^6 + 541a^4b^4c^5 - 149a^4b^5c^4 + 34a^4b^6c^3 + 6a^4b^7c^2 - 204a^5b^2c^6 + 96a^5b^3c^5 + 41a^5b^4c^4 - 132a^5b^5c^3 + 82a^5b^6c^2 - 90a^6b^2c^5 + 174a^6b^3c^4 - 104a^6b^4c^3 + 8a^6b^5c^2 + 82a^7b^2c^4 - 40a^7b^3c^3 + 20a^7b^4c^2 - 16a^8b^2c^3 + 24ab^{11}c) / a^8 * (- (b^{10} - 8a^4c^6 - 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^3c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c(-4ac - b^2)^3)^{1/2}) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} * i - (((((2048(26a^9b^7 - 12a^8b^8 - 18a^{10}b^6 + 6a^{11}b^5 - 2a^{12}b^4 + 48a^{10}c^6 + 176a^{11}c^5 + 176a^{12}c^4 + 16a^{13}c^3 - 32a^{14}c^2 + 20a^8b^7c + 74a^9b^6c - 144a^{10}b^5c - 192a^{10}b^5c - 352a^{11}b^4c + 122a^{11}b^4c
\end{aligned}$$

$$\begin{aligned}
& c - 144a^{12}b^3c^3 - 40a^{12}b^3c + 64a^{13}b^3c^2 + 16a^{13}b^2c + 8a^8b^4c^4 - 20a^8b^5c^3 + 4a^8b^6c^2 - 44a^9b^2c^5 + 116a^9b^3c^4 \\
& + 10a^9b^4c^3 - 182a^9b^5c^2 - 148a^{10}b^2c^4 + 496a^{10}b^3c^3 - 50a^{10}b^4c^2 - 260a^{11}b^2c^3 + 388a^{11}b^3c^2 - 204a^{12}b^2c^2) \\
& /a^8 + (2048\tan(x/2)*(-(b^{10} - 8a^4c^6 - 8a^5c^5 - b^7*(-(4ac - b^2)^3)^{1/2}) - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2*(-(4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3*(-(4ac - b^2)^3)^{1/2} + 3a^2b^4c^4*(-(4ac - b^2)^3)^{1/2} + 4a^3b^3c^3*(-(4ac - b^2)^3)^{1/2} - 10a^2b^3c^2*(-(4ac - b^2)^3)^{1/2} + 6ab^5c*(-(4ac - b^2)^3)^{1/2}))/2*(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2}*(32a^{16}c + 8a^{10}b^7 - 24a^{11}b^6 + 32a^{12}b^5 - 32a^{13}b^4 + 24a^{14}b^3 - 8a^{15}b^2 + 96a^{12}c^5 + 64a^{13}c^4 - 128a^{14}c^3 - 64a^{15}c^2 - 8a^{10}b^6c - 56a^{11}b^5c - 32a^{12}b^4c + 184a^{12}b^4c + 352a^{13}b^3c^3 - 200a^{13}b^3c + 288a^{14}b^2c^2 + 144a^{14}b^2c + 8a^{10}b^4c^3 - 8a^{10}b^5c^2 - 56a^{11}b^2c^4 + 40a^{11}b^3c^3 + 96a^{11}b^4c^2 - 272a^{12}b^2c^3 + 8a^{12}b^3c^2 - 320a^{13}b^2c^2 - 96a^{15}b^3c)/a^8)*(-(b^{10} - 8a^4c^6 - 8a^5c^5 - b^7*(-(4ac - b^2)^3)^{1/2}) - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2*(-(4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3*(-(4ac - b^2)^3)^{1/2} + 3a^2b^4c^4*(-(4ac - b^2)^3)^{1/2} + 4a^3b^3c^3*(-(4ac - b^2)^3)^{1/2} - 10a^2b^3c^2*(-(4ac - b^2)^3)^{1/2} + 6ab^5c*(-(4ac - b^2)^3)^{1/2}))/2*(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048\tan(x/2)*(8a^{14}c + 8a^4b^{11} - 24a^5b^{10} + 36a^6b^9 - 52a^7b^8 + 61a^8b^7 - 49a^9b^6 + 33a^{10}b^5 - 17a^{11}b^4 + 6a^{12}b^3 - 2a^{13}b^2 + 72a^8c^7 - 136a^9c^6 - 192a^{10}c^5 + 168a^{11}c^4 + 80a^{12}c^3 - 64a^{13}c^2 - 8a^4b^{10}c - 72a^5b^9c + 244a^6b^8c - 308a^7b^7c - 88a^8b^6c + 375a^8b^6c + 496a^9b^5c - 416a^9b^5c - 16a^{10}b^4c + 295a^{10}b^4c - 328a^{11}b^3c - 178a^{11}b^3c + 184a^{12}b^2c + 84a^{12}b^2c + 8a^4b^8c^3 - 8a^4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 + 220a^6b^4c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 + 192a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + 64a^8b^2c^5 - 1152a^8b^3c^4 + 521a^8b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4c^2 + 180a^{10}b^2c^3 + 770a^{10}b^3c^2 - 416a^{11}b^2c^2 - 24a^{13}b^3c)/a^8)*(-(b^{10} - 8a^4c^6 - 8a^5c^5 - b^7*(-(4ac - b^2)^3)^{1/2}) - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2*(-(4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3*(-(4ac - b^2)^3)^{1/2} + 3a^2b^4c^4*(-(4ac - b^2)^3)^{1/2} + 4a^3b^3c^3*(-(4ac - b^2)^3)^{1/2} - 10a^2b^3c^2*(-(4ac - b^2)^3)^{1/2} + 6ab^5c*(-(4ac - b^2)^3)^{1/2}))/2*(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048*(26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b^9c + 251a^5b^8c - 96a^6b^7c - 238a^6b^7c - 200a^7b^6c + 154a^7b^6c + 100a^8b^5c - 72a^8b^5c + 112a^9b^4c + 27a^9b^4c - 68a^{10}b^3c - 6a^{10}b^3c + 8a^{11}b^2c + 8a^2b^8c^4 - 20a^2b^9c^3 + 4a^2b^{10}c^2 - 60a^3b^6c^5 + 156a^3b^7c^4 + 2a^3b^8c^3 - 222a^3b^9c^2 + 136a^4b^4c^6 - 388a^4b^5c^5 - 152a^4b^6c^4 + 856a^4b^7c^3 - 202a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5b^4c^5 - 1362a^5b^5c^4 - 115a^5b^6c^3 + 635a^5b^7c^2 - 340a^6b^2c^6 + 904a^6b^3c^5 + 583a^6b^4c^4 - 564a^6b^5c^3 - 655a^6b^6c^2 - 399a^7b^2c^5 + 9a^7b^3c^4 + 536a^7b^4c^3 + 612a^7b^5c^2 - 37a^8b^2c^4 - 524a^8b^3c^3 - 354a^8b^4c^2 + 239a^9b^2c^3 + 145a^9b^3c^2 - 47a^{10}b^2c^2))/a^8)*(-(b^{10} - 8a^4c^6 - 8a^5c^5 - b^7*(-(4ac - b^2)^3)^{1/2}) - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2*(-(4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3*(-(4ac - b^2)^3)^{1/2} + 3a^2b^4c^4*(-(4ac - b^2)^3)^{1/2} + 4a^3b^3c^3*(-(4ac - b^2)^3)^{1/2} - 10a^2b^3c^2*(-(4ac - b^2)^3)^{1/2} + 6ab^5c*(-(4ac - b^2)^3)^{1/2}))/2*(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2}
\end{aligned}$$



$$\begin{aligned}
& (4a^2c - b^2)^3)^{1/2} + 3a^2b^2c^4(-4a^2c - b^2)^3)^{1/2} + 4a^3b^2c^3 \\
& *(-4a^2c - b^2)^3)^{1/2} - 10a^2b^3c^2(-4a^2c - b^2)^3)^{1/2} + 6a^2b^5c^2 \\
& *(-4a^2c - b^2)^3)^{1/2}) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 \\
& + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} \\
& + (2048 \tan(x/2) * (8a^{14}c + 8a^4b^{11} - 24a^5b^{10} + 36a^6b^9 - 52a^7b^8 \\
& + 61a^8b^7 - 49a^9b^6 + 33a^{10}b^5 - 17a^{11}b^4 + 6a^{12}b^3 - 2a^{13}b^2 + 72a^8c^7 - 136a^9c^6 \\
& - 192a^{10}c^5 + 168a^{11}c^4 + 80a^{12}c^3 - 64a^{13}c^2 - 8a^4b^{10}c - 72a^5b^9c \\
& + 244a^6b^8c - 308a^7b^7c - 88a^8b^6c + 375a^8b^6c + 496a^9b^5c^2 - 416a^9b^5c \\
& - 16a^{10}b^4c^2 + 295a^{10}b^4c - 328a^{11}b^3c^2 - 178a^{11}b^3c + 184a^{12}b^2c^2 \\
& + 84a^{12}b^2c^2 + 8a^4b^8c^3 - 8a^4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 \\
& + 220a^6b^4c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 + 19 \\
& 2a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + 64a^8b^2c^5 - 1152a^8b^3c^4 \\
& + 521a^8b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4c^2 \\
& + 180a^{10}b^2c^3 + 770a^{10}b^3c^2 - 416a^{11}b^2c^2 - 24a^{13}b^2c)) / a^8 * (-b^{10} - 8a^4c^6 \\
& - 8a^5c^5 - b^7(-4a^2c - b^2)^3)^{1/2} - b^8c^2 + 10a^2b^6c^3 - 33a^2b^4c^4 \\
& + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2 * (-4a^2c - b^2)^3)^{1/2} \\
& - 12a^2b^8c - 4a^2b^3c^3 * (-4a^2c - b^2)^3)^{1/2} + 3a^2b^2c^4 * (-4a^2c - b^2)^3)^{1/2} \\
& + 4a^3b^2c^3 * (-4a^2c - b^2)^3)^{1/2} - 10a^2b^3c^2 * (-4a^2c - b^2)^3)^{1/2} + 6a^2b^5c^2 \\
& * (-4a^2c - b^2)^3)^{1/2}) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 \\
& + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048 * (26a^3b^{11} \\
& - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 \\
& + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c \\
& - 228a^4b^9c + 251a^5b^8c - 96a^6b^7c - 238a^6b^7c - 200a^7b^6c^2 + 154a^7b^6c \\
& + 100a^8b^5c - 72a^8b^5c + 112a^9b^4c^2 + 27a^9b^4c - 68a^{10}b^3c^2 - 6a^{10}b^3c \\
& + 8a^{11}b^2c^2 + 8a^2b^8c^4 - 20a^2b^9c^3 + 4a^2b^{10}c^2 - 60a^3b^6c^5 + 156a^3b^7c^4 + 2 \\
& a^3b^8c^3 - 222a^3b^9c^2 + 136a^4b^4c^6 - 388a^4b^5c^5 - 152a^4b^6c^4 + 856a^4b^7c^3 \\
& - 202a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5b^4c^5 - 1362a^5b^5c^4 - 115a^5b^6c^3 \\
& + 635a^5b^7c^2 - 340a^6b^2c^6 + 904a^6b^3c^5 + 583a^6b^4c^4 - 564a^6b^5c^3 - 655a^6b^6c^2 \\
& - 399a^7b^2c^5 + 9a^7b^3c^4 + 536a^7b^4c^3 + 612a^7b^5c^2 - 37a^8b^2c^4 - 524a^8b^3c^3 \\
& - 354a^8b^4c^2 + 239a^9b^2c^3 + 145a^9b^3c^2 - 47a^{10}b^2c^2)) / a^8 * (-b^{10} - 8a^4c^6 - 8a^5c^5 \\
& - b^7(-4a^2c - b^2)^3)^{1/2} - b^8c^2 + 10a^2b^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 \\
& + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2 * (-4a^2c - b^2)^3)^{1/2} - 12a^2b^8c \\
& - 4a^2b^3c^3 * (-4a^2c - b^2)^3)^{1/2} + 3a^2b^2c^4 * (-4a^2c - b^2)^3)^{1/2} + 4a^3b^2c^3 \\
& * (-4a^2c - b^2)^3)^{1/2} - 10a^2b^3c^2 * (-4a^2c - b^2)^3)^{1/2} + 6a^2b^5c^2 * (-4a^2c \\
& - b^2)^3)^{1/2}) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c \\
& - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048 * \tan(x/2) * (4a^2b^{12} \\
& + 20b^{12}c - 4b^{13} - 4a^2b^{11} + 4a^3b^{10} - a^4b^9 + a^5b^8 + 12a^4c^9 - 44a^5c^8 + 2a^6c^7 \\
& + 38a^7c^6 - 18a^8c^5 + 2a^9c^4 + 4b^8c^5 - 20b^9c^4 + 40b^{10}c^3 - 40b^{11}c^2 - 24a^2b^6c^6 \\
& + 136a^2b^7c^5 - 300a^2b^8c^4 + 320a^2b^9c^3 - 160a^2b^{10}c^2 - 20a^2b^{10}c + 20a^3b^9c \\
& - 92a^4b^8c - 31a^4b^8c + 168a^5b^7c + 4a^5b^7c + 2a^6b^6c - 8a^6b^6c - 84a^7b^5c^2 \\
& + 26a^8b^4c^2 + 44a^2b^4c^7 - 300a^2b^5c^6 + 764a^2b^6c^5 - 900a^2b^7c^4 + 460a^2b^8c^3 \\
& - 44a^2b^9c^2 - 32a^3b^2c^8 + 272a^3b^3c^7 - 840a^3b^4c^6 + 1156a^3b^5c^5 - 660a^3b^6c^4 + 72a^3b^7c^3 \\
& + 8a^3b^8c^2 + 384a^4b^2c^7 - 704a^4b^3c^6 + 541a^4b^4c^5 - 149a^4b^5c^4 + 34a^4b^6c^3 \\
& + 6a^4b^7c^2 - 204a^5b^2c^6 + 96a^5b^3c^5 + 41a^5b^4c^4 - 132a^5b^5c^3 + 82a^5b^6c^2 - 90a^6b^2c^5 \\
& + 174a^6b^3c^4 - 104a^6b^4c^3 + 8a^6b^5c^2 + 82a^7b^2c^4 - 40a^7b^3c^3 + 20a^7b^4c^2 \\
& - 16a^8b^2c^3 + 24a^2b^{11}c)) / a^8 *
\end{aligned}$$

$$\begin{aligned}
& \left( -(b^{10} - 8a^4c^6 - 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^4c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c^5(-4ac - b^2)^3)^{1/2} \right) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} + (((((2048(26a^9b^7 - 12a^8b^8 - 18a^{10}b^6 + 6a^{11}b^5 - 2a^{12}b^4 + 48a^{10}c^6 + 176a^{11}c^5 + 176a^{12}c^4 + 16a^{13}c^3 - 32a^{14}c^2 + 20a^8b^7c + 74a^9b^6c - 144a^{10}b^5c^5 - 192a^{10}b^5c - 352a^{11}b^4c + 122a^{11}b^4c - 144a^{12}b^3c^3 - 40a^{12}b^3c + 64a^{13}b^2c^2 + 16a^{13}b^2c + 8a^8b^4c^4 - 20a^8b^5c^3 + 4a^8b^6c^2 - 44a^9b^2c^5 + 116a^9b^3c^4 + 10a^9b^4c^3 - 182a^9b^5c^2 - 148a^{10}b^2c^4 + 496a^{10}b^3c^3 - 50a^{10}b^4c^2 - 260a^{11}b^2c^3 + 388a^{11}b^3c^2 - 204a^{12}b^2c^2)) / a^8 + (2048 \tan(x/2) * (-(b^{10} - 8a^4c^6 - 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^4c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c^5(-4ac - b^2)^3)^{1/2} \right) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} * (32a^{16}c + 8a^{10}b^7 - 24a^{11}b^6 + 32a^{12}b^5 - 32a^{13}b^4 + 24a^{14}b^3 - 8a^{15}b^2 + 96a^{12}c^5 + 64a^{13}c^4 - 128a^{14}c^3 - 64a^{15}c^2 - 8a^{10}b^6c - 56a^{11}b^5c - 32a^{12}b^4c + 184a^{12}b^4c + 352a^{13}b^3c^3 - 200a^{13}b^3c + 288a^{14}b^2c^2 + 144a^{14}b^2c + 8a^{10}b^4c^3 - 8a^{10}b^5c^2 - 56a^{11}b^2c^4 + 40a^{11}b^3c^3 + 96a^{11}b^4c^2 - 272a^{12}b^2c^3 + 8a^{12}b^3c^2 - 320a^{13}b^2c^2 - 96a^{15}b^2c)) / a^8 * (-(b^{10} - 8a^4c^6 - 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^4c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c^5(-4ac - b^2)^3)^{1/2} \right) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048 \tan(x/2) * (8a^{14}c + 8a^4b^{11} - 24a^5b^{10} + 36a^6b^9 - 52a^7b^8 + 61a^8b^7 - 49a^9b^6 + 33a^{10}b^5 - 17a^{11}b^4 + 6a^{12}b^3 - 2a^{13}b^2 + 72a^8c^7 - 136a^9c^6 - 192a^{10}c^5 + 168a^{11}c^4 + 80a^{12}c^3 - 64a^{13}c^2 - 8a^4b^{10}c - 72a^5b^9c + 244a^6b^8c - 308a^7b^7c - 88a^8b^6c + 375a^8b^6c + 496a^9b^5c - 416a^9b^5c - 16a^{10}b^4c + 295a^{10}b^4c - 328a^{11}b^3c^3 - 178a^{11}b^3c + 184a^{12}b^2c^2 + 84a^{12}b^2c + 8a^4b^8c^3 - 8a^4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 + 220a^6b^4c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 + 192a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + 64a^8b^2c^5 - 1152a^8b^3c^4 + 521a^8b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4c^2 + 180a^{10}b^2c^3 + 770a^{10}b^3c^2 - 416a^{11}b^2c^2 - 24a^{13}b^2c)) / a^8 * (-(b^{10} - 8a^4c^6 - 8a^5c^5 - b^7(-4ac - b^2)^3)^{1/2} - b^8c^2 + 10ab^6c^3 - 33a^2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 + b^5c^2(-4ac - b^2)^3)^{1/2} - 12ab^8c - 4ab^3c^3(-4ac - b^2)^3)^{1/2} + 3a^2b^4c^4(-4ac - b^2)^3)^{1/2} + 4a^3b^3c^3(-4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c^5(-4ac - b^2)^3)^{1/2} \right) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} - (2048(26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b
\end{aligned}$$

$$\begin{aligned}
&^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 - 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 + (\tan(((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
\end{aligned}$$

$$\begin{aligned}
& ^3c^4 - 104a^6b^4c^3 + 8a^6b^5c^2 + 82a^7b^2c^4 - 40a^7b^3c^3 \\
& + 20a^7b^4c^2 - 16a^8b^2c^3 + 24ab^{11}c)) / a^8 + (((2048*(26a^3b^{11} \\
& 1 - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b^9c + 251a^5b^8c - 96a^6b^7c - 238a^6b^7c - 200a^7b^6c^6 + 154a^7b^6c + 100a^8b^5c^5 - 72a^8b^5c + 112a^9b^4c^4 + 27a^9b^4c - 68a^{10}b^3c^3 - 6a^{10}b^3c + 8a^{11}b^2c^2 + 8a^2b^8c^4 - 20a^2b^9c^3 + 4a^2b^{10}c^2 - 60a^3b^6c^5 + 156a^3b^7c^4 + 2a^3b^8c^3 - 222a^3b^9c^2 + 136a^4b^4c^6 - 388a^4b^5c^5 - 152a^4b^6c^4 + 856a^4b^7c^3 - 202a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5b^4c^5 - 1362a^5b^5c^4 - 115a^5b^6c^3 + 635a^5b^7c^2 - 340a^6b^2c^6 + 904a^6b^3c^5 + 583a^6b^4c^4 - 564a^6b^5c^3 - 655a^6b^6c^2 - 399a^7b^2c^5 + 9a^7b^3c^4 + 536a^7b^4c^3 + 612a^7b^5c^2 - 37a^8b^2c^4 - 524a^8b^3c^3 - 354a^8b^4c^2 + 239a^9b^2c^3 + 145a^9b^3c^2 - 47a^{10}b^2c^2)) / a^8 - (((2048*\tan(x/2)*(8a^{14}c + 8a^4b^{11} - 24a^5b^{10} + 36a^6b^9 - 52a^7b^8 + 61a^8b^7 - 49a^9b^6 + 33a^{10}b^5 - 17a^{11}b^4 + 6a^{12}b^3 - 2a^{13}b^2 + 72a^8c^7 - 136a^9c^6 - 192a^{10}c^5 + 168a^{11}c^4 + 80a^{12}c^3 - 64a^{13}c^2 - 8a^4b^{10}c - 72a^5b^9c + 244a^6b^8c - 308a^7b^7c - 88a^8b^6c + 375a^8b^6c + 496a^9b^5c^5 - 416a^9b^5c - 16a^{10}b^4c + 295a^{10}b^4c - 328a^{11}b^3c^3 - 178a^{11}b^3c + 184a^{12}b^2c^2 + 84a^{12}b^2c + 8a^4b^8c^3 - 8a^4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 + 220a^6b^4c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 + 192a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + 64a^8b^2c^5 - 1152a^8b^3c^4 + 521a^8b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4c^2 + 180a^{10}b^2c^3 + 770a^{10}b^3c^2 - 416a^{11}b^2c^2 - 24a^{13}b^2c)) / a^8 + (((2048*(26a^9b^7 - 12a^8b^8 - 18a^{10}b^6 + 6a^{11}b^5 - 2a^{12}b^4 + 48a^{10}c^6 + 176a^{11}c^5 + 176a^{12}c^4 + 16a^{13}c^3 - 32a^{14}c^2 + 20a^8b^7c + 74a^9b^6c - 144a^{10}b^5c^5 - 192a^{10}b^5c - 352a^{11}b^4c + 122a^{11}b^4c - 144a^{12}b^3c^3 - 40a^{12}b^3c + 64a^{13}b^2c^2 + 16a^{13}b^2c + 8a^8b^4c^4 - 20a^8b^5c^3 + 4a^8b^6c^2 - 44a^9b^2c^5 + 116a^9b^3c^4 + 10a^9b^4c^3 - 182a^9b^5c^2 - 148a^{10}b^2c^4 + 496a^{10}b^3c^3 - 50a^{10}b^4c^2 - 260a^{11}b^2c^3 + 388a^{11}b^3c^2 - 204a^{12}b^2c^2)) / a^8 - (1024*\tan(x/2)*(a^2 - 2ac + 2b^2)*(32a^{16}c + 8a^{10}b^7 - 24a^{11}b^6 + 32a^{12}b^5 - 32a^{13}b^4 + 24a^{14}b^3 - 8a^{15}b^2 + 96a^{12}c^5 + 64a^{13}c^4 - 128a^{14}c^3 - 64a^{15}c^2 - 8a^{10}b^6c - 56a^{11}b^5c - 32a^{12}b^4c^4 + 184a^{12}b^4c + 352a^{13}b^3c^3 - 200a^{13}b^3c + 288a^{14}b^2c^2 + 144a^{14}b^2c + 8a^{10}b^4c^3 - 8a^{10}b^5c^2 - 56a^{11}b^2c^4 + 40a^{11}b^3c^3 + 96a^{11}b^4c^2 - 272a^{12}b^2c^3 + 8a^{12}b^3c^2 - 320a^{13}b^2c^2 - 96a^{15}b^2c)) / a^{11}*(a^2 - 2ac + 2b^2)) / (2a^3))*(a^2 - 2ac + 2b^2)) / (2a^3))*(a^2 - 2ac + 2b^2)) / (2a^3))*(a^2 - 2ac + 2b^2)) / (2a^3)) + (((2048*\tan(x/2)*(4ab^{12} + 20b^{12}c - 4b^{13} - 4a^2b^{11} + 4a^3b^{10} - a^4b^9 + a^5b^8 + 12a^4c^9 - 44a^5c^8 + 2a^6c^7 + 38a^7c^6 - 18a^8c^5 + 2a^9c^4 + 4b^8c^5 - 20b^9c^4 + 40b^{10}c^3 - 40b^{11}c^2 - 24ab^6c^6 + 136ab^7c^5 - 300ab^8c^4 + 320ab^9c^3 - 160ab^{10}c^2 - 20a^2b^{10}c + 20a^3b^9c - 92a^4b^8c^8 - 31a^4b^8c + 168a^5b^7c^7 + 4a^5b^7c + 2a^6b^6c^6 - 8a^6b^6c - 84a^7b^5c^5 + 26a^8b^4c^4 + 44a^2b^4c^7 - 300a^2b^5c^6 + 764a^2b^6c^5 - 900a^2b^7c^4 + 460a^2b^8c^3 - 44a^2b^9c^2 - 32a^3b^2c^8 + 272a^3b^3c^7 - 840a^3b^4c^6 + 1156a^3b^5c^5 - 660a^3b^6c^4 + 72a^3b^7c^3 + 8a^3b^8c^2 + 384a^4b^2c^7 - 704a^4b^3c^6 + 541a^4b^4c^5 - 149a^4b^5c^4 + 34a^4b^6c^3 + 6a^4b^7c^2 - 204a^5b^2c^6 + 96a^5b^3c^5 + 41a^5b^4c^4 - 132a^5b^5c^3 + 82a^5b^6c^2 - 90a^6b^2c^5 + 174a^6b^3c^4 - 104a^6b^4c^3 + 8a^6b^5c^2 + 82a^7b^2c^4 - 40a^7b^3c^3 + 20a^7b^4c^2 - 16a^8b^2c^3 + 24ab^{11}c)) / a^8 - (((2048*(26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 -
\end{aligned}$$

$$\begin{aligned}
& 5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b^9 \\
& *c + 251a^5b^8c - 96a^6b^7c^2 - 238a^6b^7c - 200a^7b^6c^2 + 154a^7 \\
& *b^6c + 100a^8b^5c^5 - 72a^8b^5c + 112a^9b^4c^4 + 27a^9b^4c - 68a \\
& ^{10}b^3c^3 - 6a^{10}b^3c + 8a^{11}b^3c^2 + 8a^2b^8c^4 - 20a^2b^9c^3 + \\
& 4a^2b^{10}c^2 - 60a^3b^6c^5 + 156a^3b^7c^4 + 2a^3b^8c^3 - 222a^3 \\
& *b^9c^2 + 136a^4b^4c^6 - 388a^4b^5c^5 - 152a^4b^6c^4 + 856a^4b^ \\
& 7c^3 - 202a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5b^4c \\
& ^5 - 1362a^5b^5c^4 - 115a^5b^6c^3 + 635a^5b^7c^2 - 340a^6b^2c^6 \\
& + 904a^6b^3c^5 + 583a^6b^4c^4 - 564a^6b^5c^3 - 655a^6b^6c^2 - \\
& 399a^7b^2c^5 + 9a^7b^3c^4 + 536a^7b^4c^3 + 612a^7b^5c^2 - 37a^ \\
& 8b^2c^4 - 524a^8b^3c^3 - 354a^8b^4c^2 + 239a^9b^2c^3 + 145a^9b \\
& ^3c^2 - 47a^{10}b^2c^2)/a^8 + (((2048*\tan(x/2)*(8a^{14}c + 8a^4b^{11} - \\
& 24a^5b^{10} + 36a^6b^9 - 52a^7b^8 + 61a^8b^7 - 49a^9b^6 + 33a^{10}b \\
& ^5 - 17a^{11}b^4 + 6a^{12}b^3 - 2a^{13}b^2 + 72a^8c^7 - 136a^9c^6 - 192 \\
& *a^{10}c^5 + 168a^{11}c^4 + 80a^{12}c^3 - 64a^{13}c^2 - 8a^4b^{10}c - 72a^ \\
& 5b^9c + 244a^6b^8c - 308a^7b^7c - 88a^8b^6c^6 + 375a^8b^6c^6 + 49 \\
& 6a^9b^5c^5 - 416a^9b^5c - 16a^{10}b^4c^4 + 295a^{10}b^4c - 328a^{11}b^3 \\
& ^3 - 178a^{11}b^3c + 184a^{12}b^2c^2 + 84a^{12}b^2c + 8a^4b^8c^3 - 8a^ \\
& 4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 + 220a^6b^4 \\
& *c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 \\
& + 192a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + \\
& 64a^8b^2c^5 - 1152a^8b^3c^4 + 521a^8b^4c^3 + 779a^8b^5c^2 + 234 \\
& *a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4c^2 + 180a^{10}b^2c^3 + 770a \\
& ^{10}b^3c^2 - 416a^{11}b^2c^2 - 24a^{13}b^3c)/a^8 - (((2048*(26a^9b^7 - \\
& 12a^8b^8 - 18a^{10}b^6 + 6a^{11}b^5 - 2a^{12}b^4 + 48a^{10}c^6 + 176a^{11} \\
& *c^5 + 176a^{12}c^4 + 16a^{13}c^3 - 32a^{14}c^2 + 20a^8b^7c + 74a^9b^6 \\
& *c - 144a^{10}b^5c - 192a^{10}b^5c - 352a^{11}b^4c + 122a^{11}b^4c - 14 \\
& 4a^{12}b^3c^3 - 40a^{12}b^3c + 64a^{13}b^3c^2 + 16a^{13}b^2c + 8a^8b^4c^ \\
& 4 - 20a^8b^5c^3 + 4a^8b^6c^2 - 44a^9b^2c^5 + 116a^9b^3c^4 + 10 \\
& a^9b^4c^3 - 182a^9b^5c^2 - 148a^{10}b^2c^4 + 496a^{10}b^3c^3 - 50a^ \\
& ^{10}b^4c^2 - 260a^{11}b^2c^3 + 388a^{11}b^3c^2 - 204a^{12}b^2c^2)/a^8 + \\
& (1024*\tan(x/2)*(a^2 - 2ac + 2b^2)*(32a^{16}c + 8a^{10}b^7 - 24a^{11}b^6 \\
& + 32a^{12}b^5 - 32a^{13}b^4 + 24a^{14}b^3 - 8a^{15}b^2 + 96a^{12}c^5 + 64 \\
& a^{13}c^4 - 128a^{14}c^3 - 64a^{15}c^2 - 8a^{10}b^6c - 56a^{11}b^5c - 32a \\
& ^{12}b^4c + 184a^{12}b^4c + 352a^{13}b^3c^3 - 200a^{13}b^3c + 288a^{14}b^2 \\
& ^2 + 144a^{14}b^2c + 8a^{10}b^4c^3 - 8a^{10}b^5c^2 - 56a^{11}b^2c^4 + 4 \\
& 0a^{11}b^3c^3 + 96a^{11}b^4c^2 - 272a^{12}b^2c^3 + 8a^{12}b^3c^2 - 320 \\
& a^{13}b^2c^2 - 96a^{15}b^3c)/a^{11}*(a^2 - 2ac + 2b^2)/(2a^3))*(a^2 - 2 \\
& *ac + 2b^2)/(2a^3))*(a^2 - 2ac + 2b^2)/(2a^3))*(a^2 - 2ac + 2b^ \\
& 2)*1i)/(2a^3))/((4096*(14a^3c^9 + a^4c^8 - 10a^5c^7 + 3a^6c^6 - 4b \\
& ^4c^8 + 16b^5c^7 - 24b^6c^6 + 16b^7c^5 - 4b^8c^4 + 4ab^2c^9 - 2 \\
& 8ab^3c^8 + 56ab^4c^7 - 40ab^5c^6 + 4ab^6c^5 + 4ab^7c^4 + 12 \\
& a^2b^3c^9 - 22a^3b^3c^8 + 4a^4b^3c^7 + 6a^5b^3c^6 - 2a^6b^3c^5 - 48a^2 \\
& *b^2c^8 + 48a^2b^3c^7 - 8a^2b^4c^6 - 4a^2b^6c^4 + 4a^3b^2c^7 - \\
& 4a^3b^3c^6 + 4a^3b^5c^4 + 10a^4b^2c^6 - 8a^4b^3c^5 - a^4b^4c \\
& ^4 - a^5b^2c^5 + a^5b^3c^4)/a^8 - (((2048*\tan(x/2)*(4ab^{12} + 20b^{12} \\
& *c - 4b^{13} - 4a^2b^{11} + 4a^3b^{10} - a^4b^9 + a^5b^8 + 12a^4c^9 - 44 \\
& *a^5c^8 + 2a^6c^7 + 38a^7c^6 - 18a^8c^5 + 2a^9c^4 + 4b^8c^5 - 20 \\
& *b^9c^4 + 40b^{10}c^3 - 40b^{11}c^2 - 24ab^6c^6 + 136ab^7c^5 - 300a \\
& *b^8c^4 + 320ab^9c^3 - 160ab^{10}c^2 - 20a^2b^{10}c + 20a^3b^9c - \\
& 92a^4b^8c - 31a^4b^8c + 168a^5b^7c + 4a^5b^7c + 2a^6b^6c^6 - 8 \\
& *a^6b^6c - 84a^7b^5c^5 + 26a^8b^5c^4 + 44a^2b^4c^7 - 300a^2b^5c^6 \\
& + 764a^2b^6c^5 - 900a^2b^7c^4 + 460a^2b^8c^3 - 44a^2b^9c^2 - 3 \\
& 2a^3b^2c^8 + 272a^3b^3c^7 - 840a^3b^4c^6 + 1156a^3b^5c^5 - 660 \\
& a^3b^6c^4 + 72a^3b^7c^3 + 8a^3b^8c^2 + 384a^4b^2c^7 - 704a^4b^ \\
& 3c^6 + 541a^4b^4c^5 - 149a^4b^5c^4 + 34a^4b^6c^3 + 6a^4b^7c^2 \\
& - 204a^5b^2c^6 + 96a^5b^3c^5 + 41a^5b^4c^4 - 132a^5b^5c^3 + 82 \\
& a^5b^6c^2 - 90a^6b^2c^5 + 174a^6b^3c^4 - 104a^6b^4c^3 + 8a^6b^ \\
& 5c^2 + 82a^7b^2c^4 - 40a^7b^3c^3 + 20a^7b^4c^2 - 16a^8b^2c^3 +
\end{aligned}$$



$$\begin{aligned}
& (24ab^{11}c)/a^8 + (((2048*(26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b^9c + 251a^5b^8c - 96a^6b^7c - 238a^6b^7c - 200a^7b^6c + 154a^7b^6c + 100a^8b^5c - 72a^8b^5c + 112a^9b^4c + 27a^9b^4c - 68a^{10}b^3c - 6a^{10}b^3c + 8a^{11}b^2c + 8a^2b^8c^4 - 20a^2b^9c^3 + 4a^2b^{10}c^2 - 60a^3b^6c^5 + 156a^3b^7c^4 + 2a^3b^8c^3 - 222a^3b^9c^2 + 136a^4b^4c^6 - 388a^4b^5c^5 - 152a^4b^6c^4 + 856a^4b^7c^3 - 202a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5b^4c^5 - 1362a^5b^5c^4 - 115a^5b^6c^3 + 635a^5b^7c^2 - 340a^6b^2c^6 + 904a^6b^3c^5 + 583a^6b^4c^4 - 564a^6b^5c^3 - 655a^6b^6c^2 - 399a^7b^2c^5 + 9a^7b^3c^4 + 536a^7b^4c^3 + 612a^7b^5c^2 - 37a^8b^2c^4 - 524a^8b^3c^3 - 354a^8b^4c^2 + 239a^9b^2c^3 + 145a^9b^3c^2 - 47a^{10}b^2c^2))/a^8 - (((2048*\tan(x/2)*(8a^{14}c + 8a^4b^{11} - 24a^5b^{10} + 36a^6b^9 - 52a^7b^8 + 61a^8b^7 - 49a^9b^6 + 33a^{10}b^5 - 17a^{11}b^4 + 6a^{12}b^3 - 2a^{13}b^2 + 72a^8c^7 - 136a^9c^6 - 192a^{10}c^5 + 168a^{11}c^4 + 80a^{12}c^3 - 64a^{13}c^2 - 8a^4b^{10}c - 72a^5b^9c + 244a^6b^8c - 308a^7b^7c - 88a^8b^6c + 375a^8b^6c + 496a^9b^5c - 416a^9b^5c - 16a^{10}b^4c + 295a^{10}b^4c - 328a^{11}b^3c - 178a^{11}b^3c + 184a^{12}b^2c + 84a^{12}b^2c + 8a^4b^8c^3 - 8a^4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 112a^5b^8c^2 + 220a^6b^4c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6b^7c^2 - 256a^7b^2c^6 + 192a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5c^3 - 732a^7b^6c^2 + 64a^8b^2c^5 - 1152a^8b^3c^4 + 521a^8b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4c^2 + 180a^{10}b^2c^3 + 770a^{10}b^3c^2 - 416a^{11}b^2c^2 - 24a^{13}b^2c))/a^8 + (((2048*(26a^9b^7 - 12a^8b^8 - 18a^{10}b^6 + 6a^{11}b^5 - 2a^{12}b^4 + 48a^{10}c^6 + 176a^{11}c^5 + 176a^{12}c^4 + 16a^{13}c^3 - 32a^{14}c^2 + 20a^8b^7c + 74a^9b^6c - 144a^{10}b^5c - 192a^{10}b^5c - 352a^{11}b^4c + 122a^{11}b^4c - 144a^{12}b^3c - 40a^{12}b^3c + 64a^{13}b^2c + 16a^{13}b^2c + 8a^8b^4c^4 - 20a^8b^5c^3 + 4a^8b^6c^2 - 44a^9b^2c^5 + 116a^9b^3c^4 + 10a^9b^4c^3 - 182a^9b^5c^2 - 148a^{10}b^2c^4 + 496a^{10}b^3c^3 - 50a^{10}b^4c^2 - 260a^{11}b^2c^3 + 388a^{11}b^3c^2 - 204a^{12}b^2c^2))/a^8 - (1024*\tan(x/2)*(a^2 - 2ac + 2b^2))*(32a^{16}c + 8a^{10}b^7 - 24a^{11}b^6 + 32a^{12}b^5 - 32a^{13}b^4 + 24a^{14}b^3 - 8a^{15}b^2 + 96a^{12}c^5 + 64a^{13}c^4 - 128a^{14}c^3 - 64a^{15}c^2 - 8a^{10}b^6c - 56a^{11}b^5c - 32a^{12}b^4c + 184a^{12}b^4c + 352a^{13}b^3c - 200a^{13}b^3c + 288a^{14}b^2c + 144a^{14}b^2c + 8a^{10}b^4c^3 - 8a^{10}b^5c^2 - 56a^{11}b^2c^4 + 40a^{11}b^3c^3 + 96a^{11}b^4c^2 - 272a^{12}b^2c^3 + 8a^{12}b^3c^2 - 320a^{13}b^2c^2 - 96a^{15}b^2c))/a^{11}*(a^2 - 2ac + 2b^2))/(2a^3)*(a^2 - 2ac + 2b^2))/(2a^3)*(a^2 - 2ac + 2b^2))/(2a^3)*(a^2 - 2ac + 2b^2))/(2a^3) + (((2048*\tan(x/2)*(4a^4b^{12} + 20b^{12}c - 4b^{13} - 4a^2b^{11} + 4a^3b^{10} - a^4b^9 + a^5b^8 + 12a^4c^9 - 44a^5c^8 + 2a^6c^7 + 38a^7c^6 - 18a^8c^5 + 2a^9c^4 + 4b^8c^5 - 20b^9c^4 + 40b^{10}c^3 - 40b^{11}c^2 - 24a^4b^6c^6 + 136a^4b^7c^5 - 300a^4b^8c^4 + 320a^4b^9c^3 - 160a^4b^{10}c^2 - 20a^2b^{10}c + 20a^3b^9c - 92a^4b^8c - 31a^4b^8c + 168a^5b^7c + 4a^5b^7c + 2a^6b^6c^6 - 8a^6b^6c - 84a^7b^5c + 26a^8b^4c + 44a^2b^4c^7 - 300a^2b^5c^6 + 764a^2b^6c^5 - 900a^2b^7c^4 + 460a^2b^8c^3 - 44a^2b^9c^2 - 32a^3b^2c^8 + 272a^3b^3c^7 - 840a^3b^4c^6 + 1156a^3b^5c^5 - 660a^3b^6c^4 + 72a^3b^7c^3 + 8a^3b^8c^2 + 384a^4b^2c^7 - 704a^4b^3c^6 + 541a^4b^4c^5 - 149a^4b^5c^4 + 34a^4b^6c^3 + 6a^4b^7c^2 - 204a^5b^2c^6 + 96a^5b^3c^5 + 41a^5b^4c^4 - 132a^5b^5c^3 + 82a^5b^6c^2 - 90a^6b^2c^5 + 174a^6b^3c^4 - 104a^6b^4c^3 + 8a^6b^5c^2 + 82a^7b^2c^4 - 40a^7b^3c^3 + 20a^7b^4c^2 - 16a^8b^2c^3 + 24a^4b^{11}c))/a^8 - (((2048*(26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a^5b^9 - 20a^6b^8 + 10a^7b^7 - 4a^8b^6 + a^9b^5 + 12a^6c^8 + 88a^7c^7 + 72a^8c^6 - 44a^9c^5 - 28a^{10}c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b^9c + 251a^5b^8c - 96a^6b^7c - 23
\end{aligned}$$

```

8*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 + (((20
48*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))*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)))
    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: #instance(expn,list):
        return max(map(expnType, expn)) #apply(max,map(ExpnType,expn))
    elif is_sqrt(expn):
        if type(expn.operands()[0])==Rational: #type(instance(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: #instance(expn,Pow)
        if type(expn.operands()[1])==Integer: #instance(expn.args[1],Integer
)
            return expnType(expn.operands()[0]) #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational: #instance(expn.args[1],
Rational)
            if type(expn.operands()[0])==Rational: #instance(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: #
instance(expn,Add) or instance(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"

```