

# 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>

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# Chapter 1

## Introduction

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

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

### 1.1 Listing of CAS systems tested

The following systems were tested at this time.

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

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

Sympy was called directly using Python.

## 1.2 Results

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

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

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

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

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

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

Table 1.1: Percentage solved for each CAS

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

grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality. This can be due to one or more of the following reasons <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.

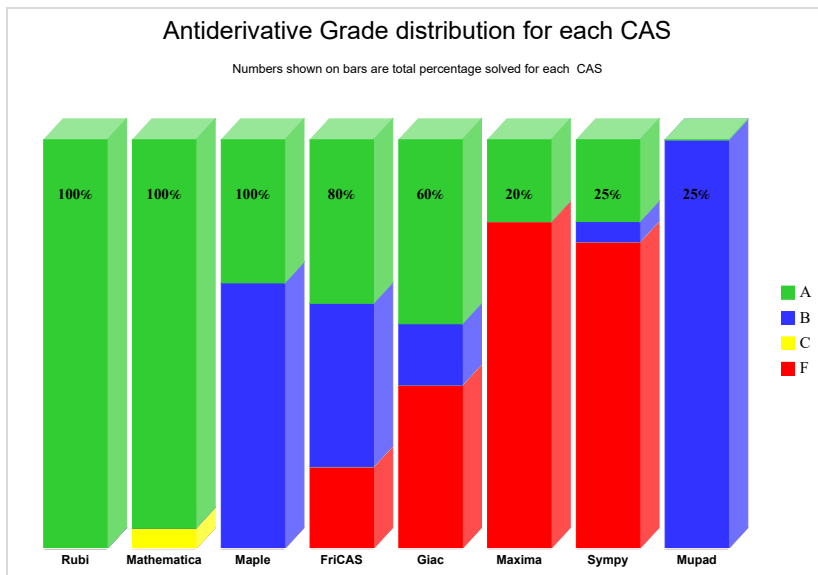
Table 1.2: Description of grading applied to integration result

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

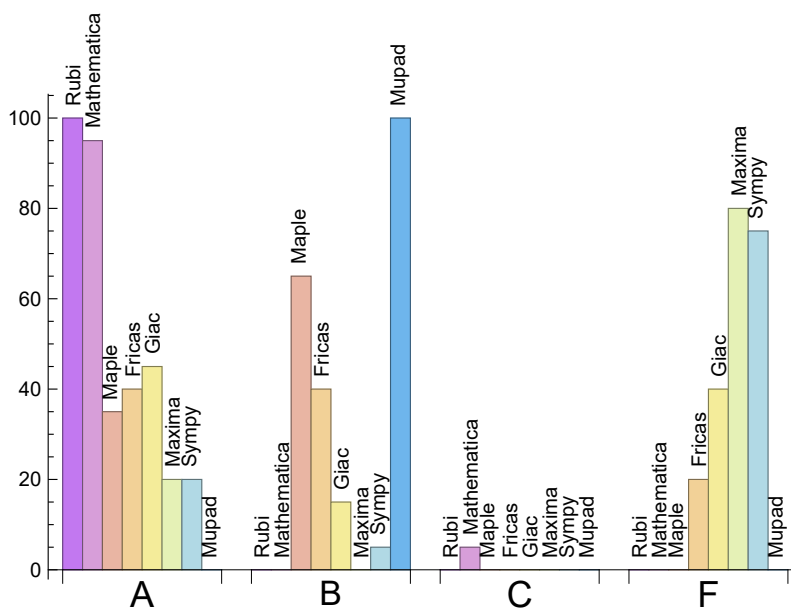
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	95.00	0.00	5.00	0.00
Maple	35.00	65.00	0.00	0.00
Maxima	20.00	0.00	0.00	80.00
Fricas	40.00	40.00	0.00	20.00
Sympy	20.00	5.00	0.00	75.00
Giac	45.00	15.00	0.00	40.00
Mupad	0.00	100.00	0.00	0.00

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.

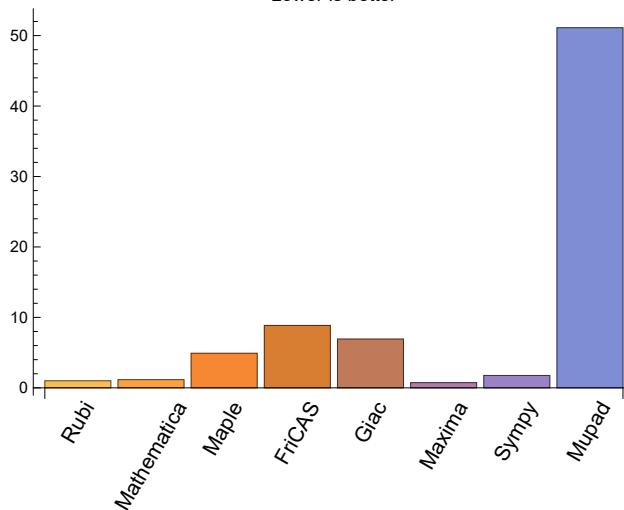
System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	1.82	191.95	1.00	226.50	1.00
Mathematica	0.73	220.15	1.16	238.50	1.03
Maple	0.11	1315.95	4.91	1209.50	4.97
Maxima	0.60	18.25	0.73	15.00	0.75
Fricas	3.42	2258.13	8.86	731.00	3.69
Sympy	0.93	54.20	1.76	26.00	1.37
Giac	36.48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

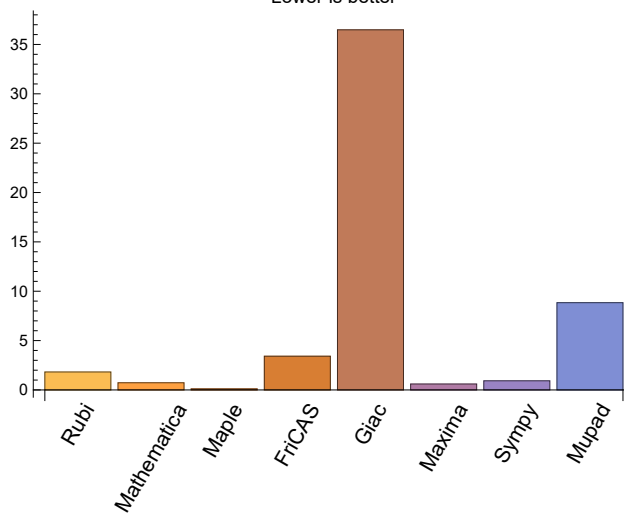
The following are bar charts for the normalized leafsize and time used columns from the above table.

**Normalized mean size of antiderivative**

Lower is better

**Mean time used (seconds)**

Lower is better



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

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

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

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

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

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

## 1.9.2 Important note about FriCAS and Giac/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 builtin system function `LeafSize` is used to find the leaf size of each antiderivative.

The other CAS systems (SageMath and Sympy) do not have special builtin 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/](http://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.

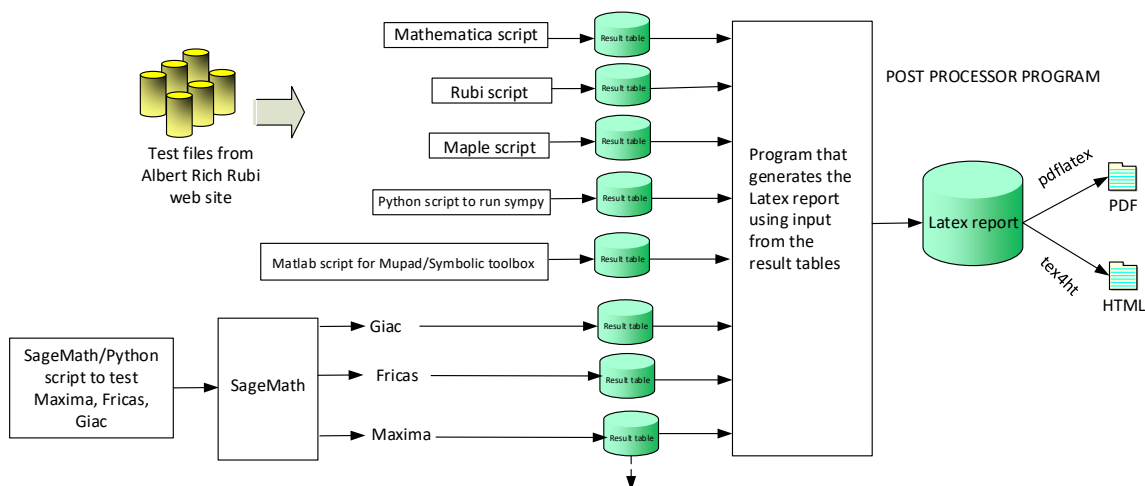
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

```
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

Continued on next page

Table 2.1 – continued from previous page

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



# Chapter 3

## Listing of integrals

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

Optimal. Leaf size=136

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

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

**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]  $\text{Int}[\text{Sin}[x]^5 / (a + b \text{Cos}[x] + c \text{Cos}[x]^2), x]$

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

Rule 206

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

### Rule 618

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

### Rule 628

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

### Rule 634

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

### Rule 1657

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

### Rule 3259

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

### Rubi steps

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

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

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

Antiderivative was successfully verified.

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

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

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

$$\left[ \frac{2(b^2c^3 - 4ac^4) \cos(x)^3 - 3(b^3c^2 - 4abc^3) \cos(x)^2 - 3(b^4 - 4ab^2c + 4ac^3 + 2c^4 + 2(a^2 - b^2)c^2) \sqrt{b^2 - 4ac}}{12c^4} \right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 
$$\begin{aligned} & [-1/6*(2*(b^2*c^3 - 4*a*c^4)*\cos(x)^3 - 3*(b^3*c^2 - 4*a*b*c^3)*\cos(x)^2 - \\ & 3*(b^4 - 4*a*b^2*c + 4*a*c^3 + 2*c^4 + 2*(a^2 - b^2)*c^2)*\sqrt{b^2 - 4*a*c} \\ & * \log(-(2*c^2*\cos(x)^2 + 2*b*c*\cos(x) + b^2 - 2*a*c + \sqrt{b^2 - 4*a*c})*(2*c \\ & *\cos(x) + b))/(c*\cos(x)^2 + b*\cos(x) + a) + 6*(b^4*c - 5*a*b^2*c^2 + 8*a*c \\ & ^4 + 2*(2*a^2 - b^2)*c^3)*\cos(x) - 3*(b^5 - 6*a*b^3*c + 8*a*b*c^3 + 2*(4*a^ \\ & 2*b - b^3)*c^2)*\log(c*\cos(x)^2 + b*\cos(x) + a))/(b^2*c^4 - 4*a*c^5), -1/6*( \\ & 2*(b^2*c^3 - 4*a*c^4)*\cos(x)^3 - 3*(b^3*c^2 - 4*a*b*c^3)*\cos(x)^2 - 6*(b^4 \\ & - 4*a*b^2*c + 4*a*c^3 + 2*c^4 + 2*(a^2 - b^2)*c^2)*\sqrt{-b^2 + 4*a*c}*\arctan \\ & (-\sqrt{-b^2 + 4*a*c}*(2*c*\cos(x) + b)/(b^2 - 4*a*c)) + 6*(b^4*c - 5*a*b^2*c \\ & ^2 + 8*a*c^4 + 2*(2*a^2 - b^2)*c^3)*\cos(x) - 3*(b^5 - 6*a*b^3*c + 8*a*b*c^ \\ & 3 + 2*(4*a^2*b - b^3)*c^2)*\log(c*\cos(x)^2 + b*\cos(x) + a))/(b^2*c^4 - 4*a*c \\ & ^5)] \end{aligned}$$

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

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

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] 
$$\begin{aligned} & -1/6*(2*c^2*\cos(x)^3 - 3*b*c*\cos(x)^2 + 6*b^2*\cos(x) - 6*a*c*\cos(x) - 12*c^ \\ & 2*\cos(x))/c^3 + 1/2*(b^3 - 2*a*b*c - 2*b*c^2)*\log(c*\cos(x)^2 + b*\cos(x) + a \\ & )/c^4 - (b^4 - 4*a*b^2*c + 2*a^2*c^2 - 2*b^2*c^2 + 4*a*c^3 + 2*c^4)*\arctan \\ & ((2*c*\cos(x) + b)/\sqrt{-b^2 + 4*a*c})/(\sqrt{-b^2 + 4*a*c}*c^4) \end{aligned}$$

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

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError >> Computation failed since Maxima requested a dditional constraints; using the 'assume' command before evaluation \*may\* 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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\cos(x) * (a/c^2 + 2/c - b^2/c^3) - \cos(x)^3 / (3*c) - (\log(a + b*\cos(x) + c*\cos(x)^2) * (b^5 - 2*b^3*c^2 + 8*a^2*b*c^2 + 8*a*b*c^3 - 6*a*b^3*c)) / (2*(4*a*c^5 - b^2*c^4)) + (b*\cos(x)^2) / (2*c^2) - (\operatorname{atan}(b / (4*a*c - b^2)^{(1/2)} + (2*c*\cos(x)) / (4*a*c - b^2)^{(1/2)}) * (4*a*c^3 + b^4 + 2*c^4 + 2*a^2*c^2 - 2*b^2*c^2 - 4*a*b^2*c)) / (c^4 * (4*a*c - b^2)^{(1/2)})$

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

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

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

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

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

Antiderivative was successfully verified.

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

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

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

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

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

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

**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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError >> Computation failed since Maxima requested 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\*atan(b/(4\*a\*c - b^2)^(1/2) + (2\*c\*cos(x))/(4\*a\*c - b^2)^(1/2)))/(4\*a\*c - b^2)^(1/2)

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Piecewise((2/(b + 2\*c\*cos(x)), Eq(a, b\*\*2/(4\*c))), (-log(a/b + cos(x))/b, 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))

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

**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] := S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 633

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

Rule 634

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

Rule 981

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

Rule 3259

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

Rubi steps



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

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError >> Computation failed since Maxima requested a dditional constraints; using the 'assume' command before evaluation \*may\* 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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

[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}

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

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] && Intege
rQ[(m - 1)/2]
```

### Rubi steps

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

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

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





$$\begin{aligned}
& c^3 + 2c^4 + 2(a^2 - b^2)c^2 - (b^4 - 4ab^2c + 4a^3c^3 + 2c^4 + 2(a^2 - b^2)c^2)\cos(x)^2\sqrt{-b^2 + 4ac}\arctan(-\sqrt{-b^2 + 4ac})\frac{(2c\cos(x) + b)}{(b^2 - 4ac)} - 4(2a^3b - 3ab^3)c - 2(a^3b^2 - ab^4 - 4a^3c^4 - (12a^2 - b^2)c^3 - (12a^3 - 7ab^2)c^2 - (4a^4 - 7a^2b^2 + b^4)c)\cos(x) - 2(b^5 - 6ab^3c + 8a^2b^2c^3 + 2(4a^2b - b^3)c^2 - (b^5 - 6ab^3c + 8a^2b^2c^3 + 2(4a^2b - b^3)c^2)\cos(x)^2)\log(c\cos(x)^2 + b\cos(x) + a) - (a^3b^2 - 3ab^4 - 2b^5 - 12a^3c^4 - (28a^2 + 16ab - 3b^2)c^3 - (20a^3 + 16a^2b - 11ab^2 - 4b^3)c^2 - (a^3b^2 - 3ab^4 - 2b^5 - 12a^3c^4 - (28a^2 + 16ab - 3b^2)c^3 - (20a^3 + 16a^2b - 11ab^2 - 4b^3)c^2 - (4a^4 - 17a^2b^2 - 12ab^3 + b^4)c)\cos(x)^2 - (4a^4 - 17a^2b^2 - 12ab^3 + b^4)c)\log(1/2\cos(x) + 1/2) + (a^3b^2 - 3ab^4 + 2b^5 - 12a^3c^4 - (28a^2 - 16ab - 3b^2)c^3 - (20a^3 - 16a^2b - 11ab^2 + 4b^3)c^2 - (a^3b^2 - 3ab^4 + 2b^5 - 12a^3c^4 - (28a^2 - 16ab - 3b^2)c^3 - (20a^3 - 16a^2b - 11ab^2 + 4b^3)c^2 - (4a^4 - 17a^2b^2 + 12ab^3 + b^4)c)\cos(x)^2 - (4a^4 - 17a^2b^2 + 12ab^3 + b^4)c)\log(-1/2\cos(x) + 1/2))/(a^4b^2 - 2a^2b^4 + b^6 - 4a^3c^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - (a^4b^2 - 2a^2b^4 + b^6 - 4a^3c^5 - (16a^2 - b^2)c^4 - 12(2a^3 - ab^2)c^3 - 2(8a^4 - 11a^2b^2 + b^4)c^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c)\cos(x)^2 - 4(a^5 - 3a^3b^2 + 2ab^4)c)]
\end{aligned}$$

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

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

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] 
$$\begin{aligned}
& -1/2(b^3 - 2ab^2c - 2b^2c^2)\log(c\cos(x)^2 + b\cos(x) + a)/(a^4 - 2a^2b^2 + b^4 + 4a^3c - 4ab^2c + 6a^2c^2 - 2b^2c^2 + 4a^3c^3 + c^4) - \\
& 1/4(a - 2b + 3c)\log(\cos(x) + 1)/(a^2 - 2ab + b^2 + 2ac - 2bc + c^2) + 1/4(a + 2b + 3c)\log(-\cos(x) + 1)/(a^2 + 2ab + b^2 + 2ac + 2bc + c^2) - \\
& (b^4 - 4ab^2c + 2a^2c^2 - 2b^2c^2 + 4a^3c^3 + 2c^4)\arctan((2c\cos(x) + b)/\sqrt{-b^2 + 4ac})/((a^4 - 2a^2b^2 + b^4 + 4a^3c - 4ab^2c + 6a^2c^2 - 2b^2c^2 + 4a^3c^3 + c^4)\sqrt{-b^2 + 4ac}) - \\
& 1/2(a^2b - b^3 + 2ab^2c + b^2c^2 - (a^3 - ab^2 + 3a^2c - b^2c + 3a^3c^2 + c^3)\cos(x))/(a + b + c)^2(a - b + c)^2(\cos(x) + 1)(\cos(x) - 1)
\end{aligned}$$

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

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



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

$$\begin{aligned} & /2)) / 2 + c^4(b^2 - 4ac)^{1/2} - b^3c^2 + 2ac^3(b^2 - 4ac)^{1/2} + \\ & 4a^2bc^2 + a^2c^2(b^2 - 4ac)^{1/2} - b^2c^2(b^2 - 4ac)^{1/2} + 4 \\ & *ab^3c - 3ab^3c - 2ab^2c(b^2 - 4ac)^{1/2}) / ((4ac - b^2)(2ac \\ & c + a^2 - b^2 + c^2)^2) * (b(4ac^3 + 4a^2c^2) - b^3(3ac + c^2) - b^2 \\ & *(c^2(b^2 - 4ac)^{1/2} + 2ac(b^2 - 4ac)^{1/2})) + b^5/2 + (b^4(b^2 \\ & - 4ac)^{1/2}) / 2 + c^4(b^2 - 4ac)^{1/2} + 2ac^3(b^2 - 4ac)^{1/2} + \\ & a^2c^2(b^2 - 4ac)^{1/2}) / (4ac^5 + 4a^5c - b^6 + 2a^2b^4 - a^4b \\ & ^2 + 16a^2c^4 + 24a^3c^3 + 16a^4c^2 - b^2c^4 + 2b^4c^2 - 12ab^2c \\ & ^3 - 12a^3b^2c - 22a^2b^2c^2 + 8ab^4c) \end{aligned}$$

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

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

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[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

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

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

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

Antiderivative was successfully verified.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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



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

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

**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(sin(x)^4/(a+b\*cos(x)+c\*cos(x)^2),x, algorithm="giac")

[Out] Timed out

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

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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



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

**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(sin(x)^4/(a+b\*cos(x)+c\*cos(x)^2),x, algorithm="maxima")

[Out]  $\frac{1}{4}*(4*c^3*\int(-2*(2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*\cos(3*x))^2 + 4*(2*a^2*b^2 - 5*a^2*c^2 - 4*a*c^3 - c^4 - (2*a^3 - a*b^2)*c)*\cos(2*x))^2 + 2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*\cos(x))^2 + 2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*\sin(3*x))^2 + 4*(2*a^2*b^2 - 5*a^2*c^2 - 4*a*c^3 - c^4 - (2*a^3 - a*b^2)*c)*\sin(2*x))^2 + 2*(4*a*b^3 - 10*a*b*c^2 - 4*b*c^3 - (6*a^2*b - b^3)*c)*\sin(2*x)*\sin(x) + 2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*\sin(x))^2 + ((b^3*c - 2*a*b*c^2 - 2*b*c^3)*\cos(3*x) + 2*(a*b^2*c - a^2*c^2 - 2*a*c^3 - c^4)*\cos(2*x) + (b^3*c - 2*a*b*c^2 - 2*b*c^3)*\cos(x))*\cos(4*x) + (b^3*c - 2*a*b*c^2 - 2*b*c^3 + 2*(4*a*b^3 - 10*a*b*c^2 - 4*b*c^3 - (6*a^2*b - b^3)*c)*\cos(2*x) + 4*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*\cos(x))*\cos(3*x) + 2*(a*b^2*c - a^2*c^2 - 2*a*c^3 - c^4 + (4*a*b^3 - 10*a*b*c^2 - 4*b*c^3 - (6*a^2*b - b^3)*c)*\cos(x))*\cos(2*x) + (b^3*c - 2*a*b*c^2 - 2*b*c^3)*\cos(x) + ((b^3*c - 2*a*b*c^2 - 2*b*c^3)*\sin(3*x) + 2*(a*b^2*c - a^2*c^2 - 2*a*c^3 - c^4)*\sin(2*x) + (b^3*c - 2*a*b*c^2 - 2*b*c^3)*\sin(x))*\sin(4*x) + 2*((4*a*b^3 - 10*a*b*c^2 - 4*b*c^3 - (6*a^2*b - b^3)*c)*\sin(2*x) + 2*(b^4 - 2*a*b^2*c - 2*b^2*c^2)*\sin(x))*\sin(3*x))/(c^5*\cos(4*x))^2 + 4*b^2*c^3*\cos(3*x))^2 + 4*b^2*c^3*\cos(x))^2 + c^5*\sin(4*x))^2 + 4*b^2*c^3*\sin(3*x))^2 + 4*b^2*c^3*\sin(x))^2 + 4*b*c^4*\cos(x) + c^5 + 4*(4*a^2*c^3 + 4*a*c^4 + c^5)*\cos(2*x))^2 + 4*(4*a^2*c^3 + 4*a*c^4 + c^5)*\sin(2*x))^2 + 8*(2*a*b*c^3 + b*c^4)*\sin(2*x)*\sin(x) + 2*(2*b*c^4*\cos(3*x) + 2*b*c^4*\cos(x) + c^5 + 2*(2*a*c^4 + c^5)*\cos(2*x))*\cos(4*x) + 4*(2*b^2*c^3*\cos(x) + b*c^4 + 2*(2*a*b*c^3 + b*c^4)*\cos(2*x))*\cos(3*x) + 4*(2*a*c^4 + c^5 + 2*(2*a*b*c^3 + b*c^4)*\cos(x))*\cos(2*x) + 4*(b*c^4*\sin(3*x) + b*c^4*\sin(x) + (2*a*c^4 + c^5)*\sin(2*x))*\sin(4*x) + 8*(b^2*c^3*\sin(x) + (2*a*b*c^3 + b*c^4)*\sin(2*x))*\sin(3*x)), x) + c^2*\sin(2*x) - 4*b*c*\sin(x) + 2*(2*b^2 - 2*a*c - 3*c^2)*x)/c^3$



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

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

$$\begin{aligned}
& ^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^5b^5c^5 \\
& + 136a^5b^6c^4 + 136a^5b^7c^3 + 136a^5b^8c^2)/c^8)*(- (8a^3c^7 + b^8 + 24a^2c^6 + 24a^3c^5 \\
& + 8a^4c^4 + b^5*(-(4a^3c - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 \\
& - 18a^2b^2c^5 + 24a^2b^4c^3 + 3b^3c^4*(-(4a^3c - b^2)^3)^{(1/2)} - 54 \\
& a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - 3b^3c^2*(-(4a^3c - b^2)^3)^{(1/2)} - 10 \\
& a^2b^6c + 3a^2b^3c^2*(-(4a^3c - b^2)^3)^{(1/2)} + 6a^2b^3c^3*(-(4a^3c - b^2)^3)^{(1/2)} \\
& - 4a^2b^3c^4*(-(4a^3c - b^2)^3)^{(1/2)})/(2*(16a^2c^8 + b^4c^6 - 8a^2b^2c^7)))^{(1/2)} + (2048*(236a^3c^{13} - 32b^3c^{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 \\
& - 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 + 77a^3b^{10}c^2 - 3714a^3b^{11}c + 6252a^3b^{12} - 1730a^4b^2c^9 \\
& + 6252a^4b^3c^8 + 1730a^4b^4c^7 - 4300a^4b^5c^6 - 79a^4b^6c^5 + 968a^4b^7c^4 + 2a^4b^8c^3 - 20a^4b^9c^2 \\
& - 3523a^4b^{10}c + 5025a^4b^{11} - 1339a^4b^{12} - 2082a^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 + 2104a^5b^{10}c \\
& + 634a^5b^{11} - 388a^5b^{12} - 60a^6b^2c^7 + 634a^6b^3c^6 + 388a^6b^4c^5 - 388a^6b^5c^4 - 60a^6b^6c^3 \\
& - 676a^6b^7c^2 + 364a^6b^8c + 136a^6b^9 - 100a^7b^2c^6 - 404a^7b^3c^5 - 404a^7b^4c^4 \\
& + 136a^7b^5c^3 + 136a^7b^6c^2 + 136a^7b^7c + 404a^7b^8 - 404a^7b^9 - 100a^8b^2c^5 - 404a^8b^3c^4 \\
& + 136a^8b^4c^3 + 136a^8b^5c^2 + 136a^8b^6c + 404a^8b^7 - 404a^8b^8 - 100a^9b^2c^4 - 404a^9b^3c^3 \\
& + 136a^9b^4c^2 + 136a^9b^5c + 404a^9b^6 - 404a^9b^7 - 100a^{10}b^2c^3 - 404a^{10}b^3c^2 \\
& + 136a^{10}b^4c + 404a^{10}b^5 - 404a^{10}b^6 - 100a^{11}b^2c^2 - 404a^{11}b^3c + 136a^{11}b^4 \\
& - 404a^{11}b^5 - 100a^{12}b^2c - 404a^{12}b^3 + 136a^{12}b^4 - 404a^{12}b^5 - 100a^{13}b^2c - 404a^{13}b^3 \\
& + 136a^{13}b^4 - 404a^{13}b^5 - 100a^{14}b^2c - 404a^{14}b^3 + 136a^{14}b^4 - 404a^{14}b^5 - 100a^{15}b^2c \\
& - 404a^{15}b^3 + 136a^{15}b^4 - 404a^{15}b^5 - 100a^{16}b^2c - 404a^{16}b^3 + 136a^{16}b^4 - 404a^{16}b^5 \\
& - 100a^{17}b^2c - 404a^{17}b^3 + 136a^{17}b^4 - 404a^{17}b^5 - 100a^{18}b^2c - 404a^{18}b^3 + 136a^{18}b^4 \\
& - 404a^{18}b^5 - 100a^{19}b^2c - 404a^{19}b^3 + 136a^{19}b^4 - 404a^{19}b^5 - 100a^{20}b^2c - 404a^{20}b^3 \\
& + 136a^{20}b^4 - 404a^{20}b^5 - 100a^{21}b^2c - 404a^{21}b^3 + 136a^{21}b^4 - 404a^{21}b^5 - 100a^{22}b^2c \\
& - 404a^{22}b^3 + 136a^{22}b^4 - 404a^{22}b^5 - 100a^{23}b^2c - 404a^{23}b^3 + 136a^{23}b^4 - 404a^{23}b^5 \\
& - 100a^{24}b^2c - 404a^{24}b^3 + 136a^{24}b^4 - 404a^{24}b^5 - 100a^{25}b^2c - 404a^{25}b^3 + 136a^{25}b^4 \\
& - 404a^{25}b^5 - 100a^{26}b^2c - 404a^{26}b^3 + 136a^{26}b^4 - 404a^{26}b^5 - 100a^{27}b^2c - 404a^{27}b^3 \\
& + 136a^{27}b^4 - 404a^{27}b^5 - 100a^{28}b^2c - 404a^{28}b^3 + 136a^{28}b^4 - 404a^{28}b^5 - 100a^{29}b^2c \\
& - 404a^{29}b^3 + 136a^{29}b^4 - 404a^{29}b^5 - 100a^{30}b^2c - 404a^{30}b^3 + 136a^{30}b^4 - 404a^{30}b^5 \\
& - 100a^{31}b^2c - 404a^{31}b^3 + 136a^{31}b^4 - 404a^{31}b^5 - 100a^{32}b^2c - 404a^{32}b^3 + 136a^{32}b^4 \\
& - 404a^{32}b^5 - 100a^{33}b^2c - 404a^{33}b^3 + 136a^{33}b^4 - 404a^{33}b^5 - 100a^{34}b^2c - 404a^{34}b^3 \\
& + 136a^{34}b^4 - 404a^{34}b^5 - 100a^{35}b^2c - 404a^{35}b^3 + 136a^{35}b^4 - 404a^{35}b^5 - 100a^{36}b^2c \\
& - 404a^{36}b^3 + 136a^{36}b^4 - 404a^{36}b^5 - 100a^{37}b^2c - 404a^{37}b^3 + 136a^{37}b^4 - 404a^{37}b^5 \\
& - 100a^{38}b^2c - 404a^{38}b^3 + 136a^{38}b^4 - 404a^{38}b^5 - 100a^{39}b^2c - 404a^{39}b^3 + 136a^{39}b^4 \\
& - 404a^{39}b^5 - 100a^{40}b^2c - 404a^{40}b^3 + 136a^{40}b^4 - 404a^{40}b^5 - 100a^{41}b^2c - 404a^{41}b^3 \\
& + 136a^{41}b^4 - 404a^{41}b^5 - 100a^{42}b^2c - 404a^{42}b^3 + 136a^{42}b^4 - 404a^{42}b^5 - 100a^{43}b^2c \\
& - 404a^{43}b^3 + 136a^{43}b^4 - 404a^{43}b^5 - 100a^{44}b^2c - 404a^{44}b^3 + 136a^{44}b^4 - 404a^{44}b^5 \\
& - 100a^{45}b^2c - 404a^{45}b^3 + 136a^{45}b^4 - 404a^{45}b^5 - 100a^{46}b^2c - 404a^{46}b^3 + 136a^{46}b^4 \\
& - 404a^{46}b^5 - 100a^{47}b^2c - 404a^{47}b^3 + 136a^{47}b^4 - 404a^{47}b^5 - 100a^{48}b^2c - 404a^{48}b^3 \\
& + 136a^{48}b^4 - 404a^{48}b^5 - 100a^{49}b^2c - 404a^{49}b^3 + 136a^{49}b^4 - 404a^{49}b^5 - 100a^{50}b^2c \\
& - 404a^{50}b^3 + 136a^{50}b^4 - 404a^{50}b^5 - 100a^{51}b^2c - 404a^{51}b^3 + 136a^{51}b^4 - 404a^{51}b^5 \\
& - 100a^{52}b^2c - 404a^{52}b^3 + 136a^{52}b^4 - 404a^{52}b^5 - 100a^{53}b^2c - 404a^{53}b^3 + 136a^{53}b^4 \\
& - 404a^{53}b^5 - 100a^{54}b^2c - 404a^{54}b^3 + 136a^{54}b^4 - 404a^{54}b^5 - 100a^{55}b^2c - 404a^{55}b^3 \\
& + 136a^{55}b^4 - 404a^{55}b^5 - 100a^{56}b^2c - 404a^{56}b^3 + 136a^{56}b^4 - 404a^{56}b^5 - 100a^{57}b^2c \\
& - 404a^{57}b^3 + 136a^{57}b^4 - 404a^{57}b^5 - 100a^{58}b^2c - 404a^{58}b^3 + 136a^{58}b^4 - 404a^{58}b^5 \\
& - 100a^{59}b^2c - 404a^{59}b^3 + 136a^{59}b^4 - 404a^{59}b^5 - 100a^{60}b^2c - 404a^{60}b^3 + 136a^{60}b^4 \\
& - 404a^{60}b^5 - 100a^{61}b^2c - 404a^{61}b^3 + 136a^{61}b^4 - 404a^{61}b^5 - 100a^{62}b^2c - 404a^{62}b^3 \\
& + 136a^{62}b^4 - 404a^{62}b^5 - 100a^{63}b^2c - 404a^{63}b^3 + 136a^{63}b^4 - 404a^{63}b^5 - 100a^{64}b^2c \\
& - 404a^{64}b^3 + 136a^{64}b^4 - 404a^{64}b^5 - 100a^{65}b^2c - 404a^{65}b^3 + 136a^{65}b^4 - 404a^{65}b^5 \\
& - 100a^{66}b^2c - 404a^{66}b^3 + 136a^{66}b^4 - 404a^{66}b^5 - 100a^{67}b^2c - 404a^{67}b^3 + 136a^{67}b^4 \\
& - 404a^{67}b^5 - 100a^{68}b^2c - 404a^{68}b^3 + 136a^{68}b^4 - 404a^{68}b^5 - 100a^{69}b^2c - 404a^{69}b^3 \\
& + 136a^{69}b^4 - 404a^{69}b^5 - 100a^{70}b^2c - 404a^{70}b^3 + 136a^{70}b^4 - 404a^{70}b^5 - 100a^{71}b^2c \\
& - 404a^{71}b^3 + 136a^{71}b^4 - 404a^{71}b^5 - 100a^{72}b^2c - 404a^{72}b^3 + 136a^{72}b^4 - 404a^{72}b^5 \\
& - 100a^{73}b^2c - 404a^{73}b^3 + 136a^{73}b^4 - 404a^{73}b^5 - 100a^{74}b^2c - 404a^{74}b^3 + 136a^{74}b^4 \\
& - 404a^{74}b^5 - 100a^{75}b^2c - 404a^{75}b^3 + 136a^{75}b^4 - 404a^{75}b^5 - 100a^{76}b^2c - 404a^{76}b^3 \\
& + 136a^{76}b^4 - 404a^{76}b^5 - 100a^{77}b^2c - 404a^{77}b^3 + 136a^{77}b^4 - 404a^{77}b^5 - 100a^{78}b^2c \\
& - 404a^{78}b^3 + 136a^{78}b^4 - 404a^{78}b^5 - 100a^{79}b^2c - 404a^{79}b^3 + 136a^{79}b^4 - 404a^{79}b^5 \\
& - 100a^{80}b^2c - 404a^{80}b^3 + 136a^{80}b^4 - 404a^{80}b^5 - 100a^{81}b^2c - 404a^{81}b^3 + 136a^{81}b^4 \\
& - 404a^{81}b^5 - 100a^{82}b^2c - 404a^{82}b^3 + 136a^{82}b^4 - 404a^{82}b^5 - 100a^{83}b^2c - 404a^{83}b^3 \\
& + 136a^{83}b^4 - 404a^{83}b^5 - 100a^{84}b^2c - 404a^{84}b^3 + 136a^{84}b^4 - 404a^{84}b^5 - 100a^{85}b^2c \\
& - 404a^{85}b^3 + 136a^{85}b^4 - 404a^{85}b^5 - 100a^{86}b^2c - 404a^{86}b^3 + 136a^{86}b^4 - 404a^{86}b^5 \\
& - 100a^{87}b^2c - 404a^{87}b^3 + 136a^{87}b^4 - 404a^{87}b^5 - 100a^{88}b^2c - 404a^{88}b^3 + 136a^{88}b^4 \\
& - 404a^{88}b^5 - 100a^{89}b^2c - 404a^{89}b^3 + 136a^{89}b^4 - 404a^{89}b^5 - 100a^{90}b^2c - 404a^{90}b^3 \\
& + 136a^{90}b^4 - 404a^{90}b^5 - 100a^{91}b^2c - 404a^{91}b^3 + 136a^{91}b^4 - 404a^{91}b^5 - 100a^{92}b^2c \\
& - 404a^{92}b^3 + 136a^{92}b^4 - 404a^{92}b^5 - 100a^{93}b^2c - 404a^{93}b^3 + 136a^{93}b^4 - 404a^{93}b^5 \\
& - 100a^{94}b^2c - 404a^{94}b^3 + 136a^{94}b^4 - 404a^{94}b^5 - 100a^{95}b^2c - 404a^{95}b^3 + 136a^{95}b^4 \\
& - 404a^{95}b^5 - 100a^{96}b^2c - 404a^{96}b^3 + 136a^{96}b^4 - 404a^{96}b^5 - 100a^{97}b^2c - 404a^{97}b^3 \\
& + 136a^{97}b^4 - 404a^{97}b^5 - 100a^{98}b^2c - 404a^{98}b^3 + 136a^{98}b^4 - 404a^{98}b^5 - 100a^{99}b^2c \\
& - 404a^{99}b^3 + 136a^{99}b^4 - 404a^{99}b^5 - 100a^{100}b^2c - 404a^{100}b^3 + 136a^{100}b^4 - 404a^{100}b^5 \\
& - 100a^{101}b^2c - 404a^{101}b^3 + 136a^{101}b^4 - 404a^{101}b^5 - 100a^{102}b^2c - 404a^{102}b^3 + 136a^{102}b^4 \\
& - 404a^{102}b^5 - 100a^{103}b^2c - 404a^{103}b^3 + 136a^{103}b^4 - 404a^{103}b^5 - 100a^{104}b^2c - 404a^{104}b^3 \\
& + 136a^{104}b^4 - 404a^{104}b^5 - 100a^{105}b^2c - 404a^{105}b^3 + 136a^{105}b^4 - 404a^{105}b^5 - 100a^{106}b^2c \\
& - 404a^{106}b^3 + 136a^{106}b^4 - 404a^{106}b^5 - 100a^{107}b^2c - 404a^{107}b^3 + 136a^{107}b^4 - 404a^{107}b^5 \\
& - 100a^{108}b^2c - 404a^{108}b^3 + 136a^{108}b^4 - 404a^{108}b^5 - 100a^{109}b^2c - 404a^{109}b^3 + 136a^{109}b^4 \\
& - 404a^{109}b^5 - 100a^{110}b^2c - 404a^{110}b^3 + 136a^{110}b^4 - 404a^{110}b^5 - 100a^{111}b^2c - 404a^{111}b^3 \\
& + 136a^{111}b^4 - 404a^{111}b^5 - 100a^{112}b^2c - 404a^{112}b^3 + 136a^{112}b^4 - 404a^{112}b^5 - 100a^{113}b^2c \\
& - 404a^{113}b^3 + 136a^{113}b^4 - 404a^{113}b^5 - 100a^{114}b^2c - 404a^{114}b^3 + 136a^{114}b^4 - 404a^{114}b^5 \\
& - 100a^{115}b^2c - 404a^{115}b^3 + 136a^{115}b^4 - 404a^{115}b^5 - 100a^{116}b^2c - 404a^{116}b^3 + 136a^{116}b^4 \\
& - 404a^{116}b^5 - 100a^{117}b^2c - 404a^{117}b^3 + 136a^{117}b^4 - 404a^{117}b^5 - 100a^{118}b^2c - 404a^{118}b^3 \\
& + 136a^{118}b^4 - 404a^{118}b^5 - 100a^{119}b^2c - 404a^{119}b^3 + 136a^{119}b^4 - 404a^{119}b^5 - 100a^{120}b^2c \\
& - 404a^{120}b^3 + 136a^{120}b^4 - 404a^{120}b^5 - 100a^{121}b^2c - 404a^{121}b^3 + 136a^{121}b^4 - 404a^{121}b^5 \\
& - 100a^{122}b^2c - 404a^{122}b^3 + 136a^{122}b^4 - 404a^{122}b^5 - 100a^{123}b^2c - 404a^{123}b^3 + 136a^{123}b^4 \\
& - 404a^{123}b^5 - 100a^{124}b^2c - 404a^{124}b^3 + 136a^{124}b^4 - 404a^{124}b^5 - 100a^{125}b^2c - 404a^{125}b^3 \\
& + 136a^{125}b^4 - 404a^{125}b^5 - 100a^{126}b^2c - 404a^{126}b^3 + 136a^{126}b^4 - 404a^{126}b^5 - 100a^{127}b^2c \\
& - 404a^{127}b^3 + 136a^{127}b^4 - 404a^{127}b^5 - 100a^{128}b^2c - 404a^{128}b^3 + 136a^{128}b^4 - 404a^{128}b^5 \\
& - 100a^{129}b^2c - 404a^{129}b^3 + 136a^{129}b^4 - 404a^{129}b^5 - 100a^{130}b^2c - 404a^{130}b^3 + 136a^{130}b^4 \\
& - 404a^{130}b^5 - 100a^{131}b^2c - 404a^{131}b^3 + 136a^{131}b^4 - 404a^{131}b^5 - 100a^{132}b^2c - 404a^{132}b^3 \\
& + 136a^{132}b^4 - 404a^{132}b^5 - 100a^{133}b^2c - 404a^{133}b^3 + 136a^{133}b^4 - 404a^{133}b^5 - 100a^{134}b^2c \\
& - 404a^{134}b^3 + 136a^{134}b^4 - 404a^{134}b^5 - 100a^{135}b^2c - 404a^{135}b^3 + 136a^{135}b^4 - 404a^{135}b^5 \\
& - 100a^{136}b^2c - 404a^{136}b^3 + 136a^{136}b^4 - 404a^{136}b^5 - 100a^{137}b^2c - 404a^{137}b^3 + 136a^{137}b^4 \\
& - 404a^{137}b^5 - 100a^{138}b^2c - 404a^{138}b^3 + 136a^{138}b^4 - 404a^{138}b^5 - 100a^{139}b^2c - 404a^{139}b^3 \\
& + 136a^{139}b^4 - 404a^{139}b^5 - 100a^{140}b^2c - 404a^{140}b^3 + 136a^{140}b^4 - 404a^{140}b^5 - 100a^{141}b^2c \\
& - 404a^{141}b^3 + 136a^{141}b^4 - 404a^{141}b^5 - 100a^{142}b^2c - 404a^{142}b^3 + 136a^{142}b^4 - 404a^{142}b^5 \\
& - 100a^{143}b^2c - 404a^{143}b^3 + 136a^{143}b^4 - 404a^{143}b^5 - 100a^{144}b^2c - 404a^{144}b^3 + 136a^{144}b^4 \\
& - 404a^{144}b^5 - 100a^{145}b^2c - 404a^{145}b^3 + 136a^{145}b^4 - 404a^{145}b^5 - 100a^{146}b^2c - 404a^{146}b^3 \\
& + 136a^{146}b^4 - 404a^{146}b^5 - 100a^{147}b^2c - 404a^{147}b^3 + 136a^{147}b^4 - 404a^{147}b^5 - 100a^{148}b^2c \\
& - 404a^{148}b^3 + 136a^{148}b^4 - 404a^{148}b^5 - 100a^{149}b^2c - 404a^{149}b^3 + 136a^{149}b^4 - 404a^{149}b^5 \\
& - 100a^{150}b^2c - 404a^{150}b^3 + 136a^{150}b^4 - 404a^{150}b^5 - 100a^{151}b^2c - 404a^{151}b^3 + 136a^{151}b^4 \\
& - 404a^{151}b^5 - 100a^{152}b^2c - 404a^{152}b^3 + 136a^{152}b^4 - 404a^{152}b^5 - 100a^{153}b^2c - 404a^{153}b^3 \\
& + 136a^{153}b^4 - 404a^{153}b^5 - 100a^{154}b^2c - 404a^{154}b^3 + 136a^{154}b^4 - 404a^{154}b^5 - 100a^{155}b^2c \\
& - 404a^{155}b^3 + 136a^{155}b^4 - 404a^{155}b^5 - 100a^{156}b^2c - 404a^{156}b^3 + 136a^{156}b^4 - 404a^{156}b^5 \\
& - 100a^{157}b^2c - 404a^{157}b^3 + 136a^{157}b^4 - 404a^{157}b^5 - 100a^{158}b^2c - 404a^{158}b^3 + 136a^{158}b^4 \\
& - 404a^{158}b^5 - 100a^{159}b^2c - 404a^{159}b^3 + 136a^{159}b^4 - 404a^{159}b^5 - 100a^{160}b^2c - 404a^{160}b^3 \\
& + 136a^{160}b^4 - 404a^{160}b^5 - 100a^{161}b^2c - 404a^{161}b^3 + 136a^{161}b^4 - 404a^{161}b^5 - 100a^{162}b^2c \\
& - 404a^{162}b^3 + 136a^{162}b^4 - 404a^{162}b^5 - 100a^{163}b^2c - 404a^{163}b^3 + 136a^{163}b^4 - 404a^{163}b^5 \\
& - 100a^{164}b^2c - 404a^{164}b^3 + 136a^{164}b^4 - 404a^{164}b^5 - 100a^{165}b^2c - 404a^{165}b^3 + 136a^{165}b^4 \\
& - 404a^{165}b^5 - 100a^{166}b^2c - 404a^{166}b^3 + 136a^{166}b^4 - 404a^{166}b^5 - 100a^{167}b^2c - 404a^{167}b^3 \\
& + 136a^{167}b^4 - 404a^{167}b^5 - 100a^{168}b^2c - 404a^{168}b^3 + 136a^{168}b^4 - 404a^{168}b^5 - 100a^{169}b^2c \\
& - 404a^{169}b^3 + 136a^{169}b^4 - 404a^{169}b^5 - 100a^{170}b^2c - 404a^{170}b^3 + 136a^{170}b^4 - 404a^{170}b^5 \\
& - 100a^{171}b^2c - 404a^{171}b^3 + 136a^{171}b^4 - 404a^{171}b^5 - 100a^{172}b^2c - 404a^{172}b^3 + 136a^{172}b^4 \\
& - 404a^{172}b^5 - 100a^{173}b^2c - 404a^{173}b^3 + 136a^{173}b^4 - 404a^{173}b^5 - 100a^{174}b^2c - 404a^{174}b^3 \\
& + 136a^{174}b^4 - 404a^{174}b^5 - 100a^{175}b^2c - 404a^{175}b^3 + 136a^{175}b^4 - 404a^{175}b^5 - 100a^{176}b^2c \\
& - 404a^{176}b^3 + 136a^{176}b^4 - 404a^{176}b^5 - 100a^{177}b^2c - 404a^{177}b^3 + 136a^{177}b^4 - 404a^{177}b^5 \\
& - 100a^{178}b^2c - 404a^{178}b^3 + 136a^{178}b^4 - 404a^{178}b^5 - 100a^{179}b^2c - 404a^{179}b^3 + 136a^{179}b^4 \\
& - 404a^{179}b^5 - 100a^{180}b^2c - 404a^{180}b^3 + 136a^{180}b^4 - 404a^{180}b^5 - 100a^{181}b^2c - 404a^{181}b^3 \\
& + 136a^{181}b^4 - 404a^{181}b^5 - 100a^{182}b^2c - 404a^{182}b^3 + 136a^{182}b^4 - 404a^{182}b^5 - 100a^{183}b^2c \\
& - 404a^{183}b^3 + 136a^{183}b^4 - 404a^{183}b^5 - 100a^{184}b^2c - 404a^{184}b^3 + 136a^{184}b^4 - 404a^{184}b^5 \\
& - 100a^{185}b^2c - 404a^{185}b^3 + 136a^{185}b^4 - 404a^{185}b^5 - 100a^{186}b^2c - 404a^{186}b^3 + 136a^{186}b^4 \\
& - 404a^{186}b^5 - 100a^{187}b^2c - 404a^{187}b^3 + 136a^{187}b^4 - 404a^{187}b^5 - 100a^{188}b^2c - 404a^{188}b^3 \\
& + 136a^{188}b^4 - 404a^{188}b^5 - 100a^{189}b^2c - 404a^{189}b^3 + 136a^{189}b^4 - 404a^{189}b^5 - 100a^{190}b^2c \\
& - 404a^{190}b^3 + 13$$



$$\begin{aligned}
& 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)} * i) / ((4096 * (16*a*b^{11} + 274*a*c^{11} - 78*b*c^{11} + 4*b^{11}*c - 4*b^{12} + 33*c^{12} - 16*a^2*b^{10} - 16*a^3*b^9 + 40*a^4*b^8 - 16*a^5*b^7 - 16*a^6*b^6 + 16*a^7*b^5 - 4*a^8*b^4 + 1008*a^2*c^{10} + 2156*a^3*c^9 + 2954*a^4*c^8 + 2688*a^5*c^7 + 1624*a^6*c^6 + 628*a^7*c^5 + 141*a^8*c^4 + 14*a^9*c^3 - 64*b^2*c^{10} + 268*b^3*c^9 - 26*b^4*c^8 - 348*b^5*c^7 + 144*b^6*c^6 + 208*b^7*c^5 - 123*b^8*c^4 - 54*b^9*c^3 + 40*b^{10}*c^2 - 520*a*b^2*c^9 + 1516*a*b^3*c^8 + 144*a*b^4*c^7 - 1564*a*b^5*c^6 + 228*a*b^6*c^5 + 740*a*b^7*c^4 - 146*a*b^8*c^3 - 164*a*b^9*c^2 - 1624*a^2*b*c^9 - 112*a^2*b^9*c - 2676*a^3*b*c^8 + 128*a^3*b^8*c - 2588*a^4*b*c^7 + 56*a^4*b^7*c - 1388*a^5*b*c^6 - 184*a^5*b^6*c - 264*a^6*b*c^5 + 80*a^6*b^5*c + 116*a^7*b*c^4 + 32*a^7*b^4*c + 74*a^8*b*c^3 - 28*a^8*b^3*c + 12*a^9*b*c^2 + 4*a^9*b^2*c - 1820*a^2*b^2*c^8 + 3576*a^2*b^3*c^7 + 1032*a^2*b^4*c^6 - 2792*a^2*b^5*c^5 - 236*a^2*b^6*c^4 + 920*a^2*b^7*c^3 + 64*a^2*b^8*c^2 - 3584*a^3*b^2*c^7 + 4472*a^3*b^3*c^6 + 2236*a^3*b^4*c^5 - 2436*a^3*b^5*c^4 - 744*a^3*b^6*c^3 + 464*a^3*b^7*c^2 - 4336*a^4*b^2*c^6 + 3040*a^4*b^3*c^5 + 2390*a^4*b^4*c^4 - 964*a^4*b^5*c^3 - 592*a^4*b^6*c^2 - 3284*a^5*b^2*c^5 + 908*a^5*b^3*c^4 + 1364*a^5*b^4*c^3 - 40*a^5*b^5*c^2 - 1500*a^6*b^2*c^4 - 104*a^6*b^3*c^3 + 384*a^6*b^4*c^2 - 360*a^7*b^2*c^3 - 144*a^7*b^3*c^2 - 24*a^8*b^2*c^2 - 544*a*b*c^{10} + 20*a*b^{10}*c) / c^8 + (((((2048*(48*a*c^{15} + 272*a^2*c^{14} + 576*a^3*c^{13} + 576*a^4*c^{12} + 272*a^5*c^{11} + 48*a^6*c^{10} - 12*b^2*c^{14} + 20*b^3*c^{13} + 18*b^4*c^{12} - 46*b^5*c^{11} + 6*b^6*c^{10} + 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^
\end{aligned}$$

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

$$\begin{aligned}
& a^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^3c^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^3c^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 \\
& c^{12} - 58b^3c^{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 - 12 \\
& 78a^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 + 10 \\
& 5b^8c^5 - 89b^9c^4 - 28b^{10}c^3 + 28b^{11}c^2 - 518ab^2c^{10} - 264a \\
& b^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^3c^{10} - 160a^2 \\
& b^{10}c + 3488a^3b^3c^9 + 320a^3b^9c + 3350a^4b^3c^8 - 300a^4b^8c + \\
& 1092a^5b^3c^7 + 136a^5b^7c - 462a^6b^3c^6 - 24a^6b^6c - 440a^7b^3 \\
& c^5 - 92a^8b^3c^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 + 2 \\
& 72a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 148ab^3c^{11} + 24ab^{11} \\
& c)) / c^8) * (-8ac^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 + b^5(-4 \\
& ac - b^2)^3)^{(1/2)} - 2b^2c^6 + 3b^4c^4 - 3b^6c^2 - 18ab^2c^5 + 2 \\
& 4ab^4c^3 + 3b^3c^4(-4ac - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4 \\
& c^2 - 38a^3b^2c^3 - 3b^3c^2(-4ac - b^2)^3)^{(1/2)} - 10ab^6c + \\
& 3a^2b^3c^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(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} + 288 \\
& ab^3c^{12} + 30ab^4c^{11} - 240ab^5c^{10} + 74ab^6c^9 + 20ab^7c^8 - \\
& 416a^2b^3c^{13} - 736a^3b^3c^{12} - 544a^4b^3c^{11} - 144a^5b^3c^{10} - 360a^2 \\
& b^2c^{12} + 728a^2b^3c^{11} - 50a^2b^4c^{10} - 182a^2b^5c^9 + 4a^2b^6 \\
& c^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^3c^{14}))) / c^8 + (2048\tan(x/2)*(-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^2c^5 + 24ab^4c^3 + 3b^3c^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^3c^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)} * (32ac^{16} - 64a^2c^{15} - 128a^3c^{14}
\end{aligned}$$



$$\begin{aligned}
& a^6 b^3 c^5 + 136 a^6 b^4 c^4 - 100 a^7 b^2 c^5 - 404 a^8 b c^4 - 12) / c^8) * (- (8 a^7 c^7 + b^8 + 24 a^2 c^6 + 24 a^3 c^5 + 8 a^4 c^4 + b^5 * (- (4 a^2 c^3 - b^2)^3)^{1/2} - 2 b^2 c^6 + 3 b^4 c^4 - 3 b^6 c^2 - 18 a^2 b^2 c^5 + 24 a^2 b^4 c^3 + 3 b^2 c^4 * (- (4 a^2 c^3 - 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^2 c^3 - b^2)^3)^{1/2} - 10 a^2 b^6 c + 3 a^2 b^2 c^2 * (- (4 a^2 c^3 - b^2)^3)^{1/2} + 6 a^2 b^3 c * (- (4 a^2 c^3 - b^2)^3)^{1/2} - 4 a^2 b^3 c * (- (4 a^2 c^3 - b^2)^3)^{1/2}) / (2 * (16 a^2 c^8 + b^4 c^6 - 8 a^2 b^2 c^7))^{1/2} + (20 \tan(x/2) * (20 a^2 b^12 + 42 a^2 c^12 - 58 b^2 c^12 + 4 b^12 c - 4 b^13 + 22 c^13 - 40 a^2 b^11 + 40 a^3 b^10 - 20 a^4 b^9 + 4 a^5 b^8 - 214 a^2 c^11 - 938 a^3 c^10 - 1538 a^4 c^9 - 1278 a^5 c^8 - 498 a^6 c^7 - 14 a^7 c^6 + 52 a^8 c^5 + 12 a^9 c^4 + 14 b^2 c^11 + 34 b^3 c^10 + 59 b^4 c^9 - 39 b^5 c^8 - 160 b^6 c^7 + 112 b^7 c^6 + 105 b^8 c^5 - 89 b^9 c^4 - 28 b^10 c^3 + 28 b^11 c^2 - 518 a^2 b^2 c^10 - 264 a^2 b^3 c^9 + 1339 a^2 b^4 c^8 - 92 a^2 b^5 c^7 - 1312 a^2 b^6 c^6 + 268 a^2 b^7 c^5 + 649 a^2 b^8 c^4 - 124 a^2 b^9 c^3 - 180 a^2 b^10 c^2 + 1550 a^2 b^2 c^10 - 160 a^2 b^10 c + 3488 a^3 b^2 c^9 + 320 a^3 b^9 c + 3350 a^4 b^2 c^8 - 300 a^4 b^8 c + 1092 a^5 b^2 c^7 + 136 a^5 b^7 c - 462 a^6 b^2 c^6 - 24 a^6 b^6 c - 440 a^7 b^2 c^5 - 92 a^8 b^2 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^8 b^2 c^3 + 24 a^8 b^11 c) / c^8) * (- (8 a^7 c^7 + b^8 + 24 a^2 c^6 + 24 a^3 c^5 + 8 a^4 c^4 + b^5 * (- (4 a^2 c^3 - b^2)^3)^{1/2} - 2 b^2 c^6 + 3 b^4 c^4 - 3 b^6 c^2 - 18 a^2 b^2 c^5 + 24 a^2 b^4 c^3 + 3 b^2 c^4 * (- (4 a^2 c^3 - 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^2 c^3 - b^2)^3)^{1/2} - 10 a^2 b^6 c + 3 a^2 b^2 c^2 * (- (4 a^2 c^3 - b^2)^3)^{1/2} + 6 a^2 b^3 c * (- (4 a^2 c^3 - b^2)^3)^{1/2} - 4 a^2 b^3 c * (- (4 a^2 c^3 - b^2)^3)^{1/2}) / (2 * (16 a^2 c^8 + b^4 c^6 - 8 a^2 b^2 c^7))^{1/2}) * (- (8 a^7 c^7 + b^8 + 24 a^2 c^6 + 24 a^3 c^5 + 8 a^4 c^4 + b^5 * (- (4 a^2 c^3 - b^2)^3)^{1/2} - 2 b^2 c^6 + 3 b^4 c^4 - 3 b^6 c^2 - 18 a^2 b^2 c^5 + 24 a^2 b^4 c^3 + 3 b^2 c^4 * (- (4 a^2 c^3 - 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^2 c^3 - b^2)^3)^{1/2} - 10 a^2 b^6 c + 3 a^2 b^2 c^2 * (- (4 a^2 c^3 - b^2)^3)^{1/2} + 6 a^2 b^3 c * (- (4 a^2 c^3 - b^2)^3)^{1/2} - 4 a^2 b^3 c * (- (4 a^2 c^3 - b^2)^3)^{1/2}) / (2 * (16 a^2 c^8 + b^4 c^6 - 8 a^2 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}((((((2048 * (48 a^2 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^2 b^2 c^13 + 288 a^2 b^3 c^12 + 30 a^2 b^4 c^11 - 240 a^2 b^5 c^10 + 74 a^2 b^6 c^9 + 20 a^2 b^7 c^8 - 416 a^2 b^2 c^13 - 736 a^3 b^2 c^12 - 544 a^4 b^2 c^11 - 144 a^5 b^2 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
\end{aligned}$$

$$\begin{aligned}
& *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^8 \\
& 10 + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9 - 80*a*b*c^{14})/c^8 - \\
& (2048*\tan(x/2)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 \\
& + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a*b^6*c \\
& - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^{(1/2)}*(32*a*c^{16} - 64*a^2*c^{15} - 128*a^3*c^{14} + 64*a^4*c^{13} + 96*a^5*c^{12} - 8*b^2*c^{15} + 24*b^3*c^{14} - 32*b^4*c^{13} + 32*b^5*c^{12} - 24*b^6*c^{11} + 8*b^7*c^{10} + 144*a*b^2*c^{14} - 200*a*b^3*c^{13} + 184*a*b^4*c^{12} - 56*a*b^5*c^{11} - 8*a*b^6*c^{10} + 288*a^2*b*c^{14} + 352*a^3*b*c^{13} - 32*a^4*b*c^{12} - 320*a^2*b^2*c^{13} + 8*a^2*b^3*c^{12} + 96*a^2*b^4*c^{11} - 8*a^2*b^5*c^{10} - 272*a^3*b^2*c^{12} + 40*a^3*b^3*c^{11} + 8*a^3*b^4*c^{10} - 56*a^4*b^2*c^{11} - 96*a*b*c^{15})/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^{(1/2)} + (2048*\tan(x/2)*(24*b*c^{14} - 96*a*c^{14} - 8*c^{15} + 152*a^2*c^{13} + 952*a^3*c^{12} + 1096*a^4*c^{11} + 304*a^5*c^{10} - 152*a^6*c^9 - 72*a^7*c^8 + 2*b^2*c^{13} - 38*b^3*c^{12} - 7*b^4*c^{11} + 39*b^5*c^{10} - 15*b^6*c^9 + 35*b^7*c^8 - 44*b^8*c^7 - 4*b^9*c^6 + 24*b^{10}*c^5 - 8*b^{11}*c^4 + 68*a*b^2*c^{12} + 42*a*b^3*c^{11} - 159*a*b^4*c^{10} - 400*a*b^5*c^9 + 537*a*b^6*c^8 + 68*a*b^7*c^7 - 276*a*b^8*c^6 + 72*a*b^9*c^5 + 8*a*b^{10}*c^4 - 944*a^2*b*c^{12} - 2520*a^3*b*c^{11} - 1824*a^4*b*c^{10} - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^{11} + 1742*a^2*b^3*c^{10} - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^{10} + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^{13})/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^{(1/2)} + (2048*(236*a*c^{13} - 32*b*c^{13} + 12*c^{14} + 1084*a^2*c^{12} + 2328*a^3*c^{11} + 2784*a^4*c^{10} + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^{12} + 121*b^3*c^{11} + 61*b^4*c^{10} - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^{10}*c^4 + 26*b^{11}*c^3 - 12*b^{12}*c^2 - 635*a*b^2*c^{11} + 1300*a*b^3*c^{10} + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^{10}*c^3 + 20*a*b^{11}*c^2
\end{aligned}$$



$$\begin{aligned}
& ^{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^5b^3c^8)/c^8 + (2048\tan(x/2)*(-(8a^7c + 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^3c^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}*(32a^{16}c^{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} - 96a^4b^3c^{10} - 56a^4b^4c^9)/c^8)*(-(8a^7c + 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^3c^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^3c^{14} - 96b^4c^{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 + 136a^6b^3c^6)/c^8)*(-(8a^7c + 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^3c^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^3c^{13} - 32b^3c^{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 - 179
\end{aligned}$$



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

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





$$\begin{aligned}
& 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} - 2520*a^3*b*c^{11} - 1824*a^4*b*c^{10} - 272*a^5*b*c^9 + 88*a^6*b*c^8 + 584*a^2*b^2*c^{11} + 1742*a^2*b^3*c^{10} - 1645*a^2*b^4*c^9 - 795*a^2*b^5*c^8 + 1132*a^2*b^6*c^7 - 112*a^2*b^7*c^6 - 112*a^2*b^8*c^5 + 8*a^2*b^9*c^4 + 476*a^3*b^2*c^{10} + 2766*a^3*b^3*c^9 - 1705*a^3*b^4*c^8 - 396*a^3*b^5*c^7 + 456*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4*b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2*c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b*c^{13})/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*(236*a*c^{13} - 32*b*c^{13} + 12*c^{14} + 1084*a^2*c^{12} + 2328*a^3*c^{11} + 2784*a^4*c^{10} + 1948*a^5*c^9 + 780*a^6*c^8 + 160*a^7*c^7 + 12*a^8*c^6 - 39*b^2*c^{12} + 121*b^3*c^{11} + 61*b^4*c^{10} - 220*b^5*c^9 - 36*b^6*c^8 + 232*b^7*c^7 - 28*b^8*c^6 - 127*b^9*c^5 + 42*b^{10}*c^4 + 26*b^{11}*c^3 - 12*b^{12}*c^2 - 635*a*b^2*c^{11} + 1300*a*b^3*c^{10} + 608*a*b^4*c^9 - 1792*a*b^5*c^8 - 60*a*b^6*c^7 + 1218*a*b^7*c^6 - 249*a*b^8*c^5 - 340*a*b^9*c^4 + 98*a*b^{10}*c^3 + 20*a*b^{11}*c^2 - 1616*a^2*b*c^{11} - 3160*a^3*b*c^{10} - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b*c^6 - 2242*a^2*b^2*c^{10} + 4146*a^2*b^3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9*c^3 + 4*a^2*b^{10}*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2082*a^4*b^5*c^5 - 192*a^4*b^6*c^4 + 156*a^4*b^7*c^3 + 8*a^4*b^8*c^2 - 2031*a^5*b^2*c^7 + 2104*a^5*b^3*c^6 + 634*a^5*b^4*c^5 - 388*a^5*b^5*c^4 - 60*a^5*b^6*c^3 - 676*a^6*b^2*c^6 + 364*a^6*b^3*c^5 + 136*a^6*b^4*c^4 - 100*a^7*b^2*c^5 - 404*a*b*c^{12})/c^8)*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) + 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^8 + b^4*c^6 - 8*a*b^2*c^7)))^(1/2) + (2048*tan(x/2)*(20*a*b^{12} + 42*a*c^{12} - 58*b*c^{12} + 4*b^{12}*c - 4*b^{13} + 22*c^{13} - 40*a^2*b^{11} + 40*a^3*b^{10} - 20*a^4*b^9 + 4*a^5*b^8 - 214*a^2*c^{11} - 938*a^3*c^{10} - 1538*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^{11} + 34*b^3*c^{10} + 59*b^4*c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - 28*b^{10}*c^3 + 28*b^{11}*c^2 - 518*a*b^2*c^{10} - 264*a*b^3*c^9 + 1339*a*b^4*c^8 - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^9*c^3 - 180*a*b^{10}*c^2 + 1550*a^2*b
\end{aligned}$$

$$\begin{aligned}
& *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 \\
& 563*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 - 1 \\
& 456*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 + 15 \\
& 72*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 - 1 \\
& 8*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} - 54*a^2*b^2* \\
& c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} \\
& - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a*b*c^3*(-(4*a*c - \\
& b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)))/(2*(16*a^2*c^8 + b^4*c^ \\
& 6 - 8*a*b^2*c^7)))^{(1/2))*(-(8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a \\
& ^4*c^4 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - \\
& 18*a*b^2*c^5 + 24*a*b^4*c^3 - 3*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} - 54*a^2*b^ \\
& 2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + 3*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} \\
& ) - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a*b*c^3*(-(4*a*c \\
& - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)))/(2*(16*a^2*c^8 + b^4*c \\
& ^6 - 8*a*b^2*c^7)))^{(1/2)}*2i + (\operatorname{atan}(((((((2048*(236*a*c^{13} - 32*b*c^{13} + \\
& 12*c^{14} + 1084*a^2*c^{12} + 2328*a^3*c^{11} + 2784*a^4*c^{10} + 1948*a^5*c^9 + 78 \\
& 0*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} - 3 \\
& 160*a^3*b*c^{10} - 3440*a^4*b*c^9 - 2132*a^5*b*c^8 - 704*a^6*b*c^7 - 96*a^7*b \\
& *c^6 - 2242*a^2*b^2*c^{10} + 4146*a^2*b^3*c^9 + 1420*a^2*b^4*c^8 - 4158*a^2*b \\
& ^5*c^7 + 77*a^2*b^6*c^6 + 1735*a^2*b^7*c^5 - 234*a^2*b^8*c^4 - 222*a^2*b^9* \\
& c^3 + 4*a^2*b^{10}*c^2 - 3714*a^3*b^2*c^9 + 6252*a^3*b^3*c^8 + 1730*a^3*b^4*c \\
& ^7 - 4300*a^3*b^5*c^6 - 79*a^3*b^6*c^5 + 968*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - \\
& 20*a^3*b^9*c^2 - 3523*a^4*b^2*c^8 + 5025*a^4*b^3*c^7 + 1339*a^4*b^4*c^6 - 2 \\
& 082*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*\operatorname{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*
\end{aligned}$$

$$\begin{aligned}
& 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 + 47 \\
& 6*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 + 45 \\
& 6*a^3*b^6*c^6 - 56*a^3*b^7*c^5 - 8*a^3*b^8*c^4 + 230*a^4*b^2*c^9 + 880*a^4* \\
& b^3*c^8 - 656*a^4*b^4*c^7 + 140*a^4*b^5*c^6 + 72*a^4*b^6*c^5 + 464*a^5*b^2* \\
& c^8 - 192*a^5*b^3*c^7 - 220*a^5*b^4*c^6 + 256*a^6*b^2*c^7 + 136*a*b^*c^{13})/ \\
& c^8 + (((2048*(48*a^*c^{15} + 272*a^2*c^{14} + 576*a^3*c^{13} + 576*a^4*c^{12} + 272 \\
& *a^5*c^{11} + 48*a^6*c^{10} - 12*b^2*c^{14} + 20*b^3*c^{13} + 18*b^4*c^{12} - 46*b^5* \\
& c^{11} + 6*b^6*c^{10} + 26*b^7*c^9 - 12*b^8*c^8 - 140*a*b^2*c^{13} + 288*a*b^3*c^ \\
& 12 + 30*a*b^4*c^{11} - 240*a*b^5*c^{10} + 74*a*b^6*c^9 + 20*a*b^7*c^8 - 416*a^2 \\
& *b^*c^{13} - 736*a^3*b^*c^{12} - 544*a^4*b^*c^{11} - 144*a^5*b^*c^{10} - 360*a^2*b^2*c^ \\
& 12 + 728*a^2*b^3*c^{11} - 50*a^2*b^4*c^{10} - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - \\
& 360*a^3*b^2*c^{11} + 544*a^3*b^3*c^{10} + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 17 \\
& 2*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^1 \\
& 2 + 96*a^2*b^4*c^{11} - 8*a^2*b^5*c^{10} - 272*a^3*b^2*c^{12} + 40*a^3*b^3*c^{11} + \\
& 8*a^3*b^4*c^{10} - 56*a^4*b^2*c^{11} - 96*a*b^*c^{15}))/c^{11}*(a*c*1i - b^2*1i + \\
& (c^2*3i)/2))/c^3*(a*c*1i - b^2*1i + (c^2*3i)/2))/c^3*(a*c*1i - b^2*1i + ( \\
& c^2*3i)/2))/c^3 - (2048*tan(x/2)*(20*a*b^12 + 42*a*c^{12} - 58*b^*c^{12} + 4*b^1 \\
& 2*c - 4*b^13 + 22*c^{13} - 40*a^2*b^11 + 40*a^3*b^10 - 20*a^4*b^9 + 4*a^5*b^8 \\
& - 214*a^2*c^{11} - 938*a^3*c^{10} - 1538*a^4*c^9 - 1278*a^5*c^8 - 498*a^6*c^7 \\
& - 14*a^7*c^6 + 52*a^8*c^5 + 12*a^9*c^4 + 14*b^2*c^{11} + 34*b^3*c^{10} + 59*b^4 \\
& *c^9 - 39*b^5*c^8 - 160*b^6*c^7 + 112*b^7*c^6 + 105*b^8*c^5 - 89*b^9*c^4 - \\
& 28*b^10*c^3 + 28*b^11*c^2 - 518*a*b^2*c^{10} - 264*a*b^3*c^9 + 1339*a*b^4*c^8 \\
& - 92*a*b^5*c^7 - 1312*a*b^6*c^6 + 268*a*b^7*c^5 + 649*a*b^8*c^4 - 124*a*b^ \\
& 9*c^3 - 180*a*b^10*c^2 + 1550*a^2*b^*c^{10} - 160*a^2*b^10*c + 3488*a^3*b^*c^9 \\
& + 320*a^3*b^9*c + 3350*a^4*b^*c^8 - 300*a^4*b^8*c + 1092*a^5*b^*c^7 + 136*a^5 \\
& *b^7*c - 462*a^6*b^*c^6 - 24*a^6*b^6*c - 440*a^7*b^*c^5 - 92*a^8*b^*c^4 - 1568 \\
& *a^2*b^2*c^9 - 2708*a^2*b^3*c^8 + 3564*a^2*b^4*c^7 + 1964*a^2*b^5*c^6 - 279 \\
& 0*a^2*b^6*c^5 - 922*a^2*b^7*c^4 + 1048*a^2*b^8*c^3 + 276*a^2*b^9*c^2 - 652* \\
& a^3*b^2*c^8 - 6280*a^3*b^3*c^7 + 2020*a^3*b^4*c^6 + 4988*a^3*b^5*c^5 - 1118 \\
& *a^3*b^6*c^4 - 2008*a^3*b^7*c^3 + 140*a^3*b^8*c^2 + 2350*a^4*b^2*c^7 - 5630 \\
& *a^4*b^3*c^6 - 2295*a^4*b^4*c^5 + 3563*a^4*b^5*c^4 + 1260*a^4*b^6*c^3 - 740 \\
& *a^4*b^7*c^2 + 3314*a^5*b^2*c^6 - 1456*a^5*b^3*c^5 - 2771*a^5*b^4*c^4 + 308 \\
& *a^5*b^5*c^3 + 732*a^5*b^6*c^2 + 1572*a^6*b^2*c^5 + 576*a^6*b^3*c^4 - 696*a \\
& ^6*b^4*c^3 - 300*a^6*b^5*c^2 + 192*a^7*b^2*c^4 + 272*a^7*b^3*c^3 + 44*a^7*b \\
& ^4*c^2 - 32*a^8*b^2*c^3 + 148*a*b^*c^{11} + 24*a*b^{11}*c))/c^8*(a*c*1i - b^2*1 \\
& i + (c^2*3i)/2)*1i)/c^3 - (((((2048*(236*a^*c^{13} - 32*b^*c^{13} + 12*c^{14} + 108 \\
& 4*a^2*c^{12} + 2328*a^3*c^{11} + 2784*a^4*c^{10} + 1948*a^5*c^9 + 780*a^6*c^8 + 1 \\
& 60*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^
\end{aligned}$$

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



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

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

$$\begin{aligned}
& a^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^1 + 24a^8b^5c^0)/c^8 * (a^2c^3 - b^2c^3 + (c^2 * 3i)/2)/c^3 + (((((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 - 3714a^3b^12c^0 + 6252a^4b^2c^9 + 1730a^4b^3c^8 + 1730a^4b^4c^7 - 4300a^4b^5c^6 - 79a^4b^6c^5 + 968a^4b^7c^4 + 2a^4b^8c^3 - 20a^4b^9c^2 - 3523a^4b^10c^1 + 5025a^4b^11c^0 + 1339a^4b^12c^0 - 2082a^5b^2c^8 - 192a^5b^3c^7 + 156a^5b^4c^6 + 156a^5b^5c^5 + 8a^5b^6c^4 - 2031a^5b^7c^3 + 2104a^5b^8c^2 + 634a^5b^9c^1 + 634a^5b^10c^0 - 388a^5b^11c^0 - 60a^5b^12c^0 - 676a^6b^2c^6 + 364a^6b^3c^5 + 136a^6b^4c^4 - 100a^6b^5c^3 - 404a^6b^6c^2 + 120a^6b^7c^1 + 120a^6b^8c^0 - 100a^6b^9c^0 - 404a^6b^10c^0 - 404a^6b^11c^0 - 404a^6b^12c^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^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^11c^3 - 2520a^2b^12c^2 - 1824a^3b^2c^10 - 272a^3b^3c^9 + 88a^3b^4c^8 + 584a^3b^5c^7 - 112a^3b^6c^6 - 112a^3b^7c^5 - 112a^3b^8c^4 + 476a^3b^9c^3 + 2766a^3b^10c^2 - 1705a^3b^11c^1 - 396a^3b^12c^0 + 456a^3b^13c^0 - 56a^3b^14c^0 - 8a^3b^15c^0 + 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 + 136a^4b^12c^0)/c^8 - (((2048 * (48a^2c^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^10c^5 - 144a^2b^11c^4 - 360a^2b^12c^3 + 728a^2b^13c^2 - 50a^2b^14c^1 - 182a^2b^15c^0 + 4a^2b^16c^0 - 360a^3b^2c^11 + 544a^3b^3c^10 + 10a^3b^4c^9 - 20a^3b^5c^8 - 172a^3b^6c^7 + 116a^3b^7c^6 + 8a^3b^8c^5 - 44a^3b^9c^4 - 80a^3b^10c^3 - 80a^3b^11c^2 - 80a^3b^12c^1 - 80a^3b^13c^0 - 80a^3b^14c^0 - 80a^3b^15c^0 - 80a^3b^16c^0)/c^8 + (2048 * tan(x/2) * (a^2c^3 - b^2c^3 + (c^2 * 3i)/2))/c^8
\end{aligned}$$

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

```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out

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

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

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

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

Antiderivative was successfully verified.

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

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

**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 + (

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

### Rule 3267

$\text{Int}[(a + \cos[(d + e)x])^n (b + \cos[(d + e)x])^{n2} (c + \sin[(d + e)x])^p, x\_Symbol] :> \text{Int}[\text{ExpandTrig}[(1 - \cos[d + ex])^{m/2} (a + b \cos[d + ex]^n + c \cos[d + ex]^{2n})^p, x], x] /; \text{FreeQ}[\{a, b, c, d, e\}, x] \&\& \text{EqQ}[n2, 2n] \&\& \text{IntegerQ}[m/2] \&\& \text{NeQ}[b^2 - 4ac, 0] \&\& \text{IntegersQ}[n, p]$

### Rule 3293

$\text{Int}[(\cos[(d + e)x] (B + A)) / (a + \cos[(d + e)x] (b + \cos[(d + e)x]^2 (c))), x\_Symbol] :> \text{Module}[\{q = \text{Rt}[b^2 - 4ac, 2]\}, \text{Dist}[B + (bB - 2Ac)/q, \text{Int}[1/(b + q + 2c \cos[d + ex]), x], x] + \text{Dist}[B - (bB - 2Ac)/q, \text{Int}[1/(b - q + 2c \cos[d + ex]), x], x]] /; \text{FreeQ}[\{a, b, c, d, e, A, B\}, x] \&\& \text{NeQ}[b^2 - 4ac, 0]$

### Rubi steps

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







$$\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)*\text{abs}(a - b + c)*\text{abs}(c) + (2*a^3*b^3*c^2 - 4*a^2*b^4*c^2 + 2*a*b^5*c^2 - 8*a^4*b*c^3 + 20*a^3*b^2*c^3 - 1 \\
& 4*a^2*b^3*c^3 + 4*a*b^4*c^3 - 2*b^5*c^3 - 16*a^4*c^4 + 24*a^3*b*c^4 - 12*a^2*b^2*c^4 + 6*a*b^3*c^4 - 16*a^3*c^5 + 8*a^2*b*c^5 - 4*a*b^2*c^5 + 6*b^3*c^5 \\
& + 16*a^2*c^6 - 24*a*b*c^6 - 4*b^2*c^6 + 16*a*c^7 + 3*\sqrt{a^2 - a*b + b*c - c^2 - \sqrt{b^2 - 4*a*c}}*(a - b + c))*\sqrt{b^2 - 4*a*c}*a^3*b*c^2 - 2*(b^2 - 4*a*c)*a^3*b*c^2 - 2*\sqrt{a^2 - a*b + b*c - c^2 - \sqrt{b^2 - 4*a*c}}*(a - b + c))*\sqrt{b^2 - 4*a*c}*a^2*b^2*c^2 + 4*(b^2 - 4*a*c)*a^2*b^2*c^2 - 5*s \\
& \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))*\sqrt{b^2 - 4*a*c}}*a^2*c^4 - 4*(b^2 - 4*a*c)*a^2*c^4 - 3*\sqrt{a^2 - a*b + b*c - c^2 - \sqrt{b^2 - 4*a*c}}*(a - b + c))*\sqrt{b^2 - 4*a*c}}*a*b*c^4 + 2*(b^2 - 4*a*c)*a*b*c^4 + 4*s \\
& \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)*\text{abs}(a - b + c))*(\text{pi}\text{floor}(1/2*x/\text{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)*\text{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*
\end{aligned}$$

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

$$\begin{aligned}
& + c))\sqrt{b^2 - 4ac}ab^3c^2 - 2(b^2 - 4ac)ab^3c^2 + 6\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}a^3c^3 \\
& - 4(b^2 - 4ac)a^3c^3 + 7\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}a^2b^2c^3 + 6(b^2 - 4ac)a^2b^2c^3 - \\
& 2\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}ab^2c^3 - 4(b^2 - 4ac)ab^2c^3 + 5\sqrt{a^2 - ab + bc - c^2 + \\
& \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}b^3c^3 + 2(b^2 - 4ac)b^3c^3 + 22\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac} \\
& a^2c^4 - 4(b^2 - 4ac)a^2c^4 - 3\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}ab^2c^4 + 2(b^2 - 4ac)ab^2c^4 + \\
& 4\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}b^2c^4 - 38\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac} \\
& (a - b + c)\sqrt{b^2 - 4ac}ac^5 + 4(b^2 - 4ac)ac^5 - 7\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}b^2c^5 - \\
& 6(b^2 - 4ac)b^2c^5 + 10\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}c^6 + 4(b^2 - 4ac)c^6)\operatorname{abs}(a - \\
& b + c)(\pi\operatorname{floor}(1/2x/\pi + 1/2) + \arctan(2\sqrt{1/2}\tan(1/2x)/\sqrt{(2ac - 2c^2 - \sqrt{-4(ac + bc + c^2)}(ac - bc + c^2) + 4(ac - c^2)^2)}) \\
& )/(ac - bc + c^2)))/((3a^5b^2c^2 - 5a^4b^3c^2 - 6a^3b^4c^2 + 10a^2b^5c^2 + 3ab^6c^2 - 5b^7c^2 - 12a^6c^3 + 20a^5b^2c^3 + 47a^4b^2c^3 - \\
& 60a^3b^3c^3 - 46a^2b^4c^3 + 40ab^5c^3 + 11b^6c^3 - 92a^5c^4 + 80a^4b^2c^4 + 182a^3b^2c^4 - 94a^2b^3c^4 - 78ab^4c^4 - \\
& 6b^5c^4 - 184a^4c^5 + 56a^3b^2c^5 + 166a^2b^2c^5 + 36ab^3c^5 - 6b^4c^5 - 120a^3c^6 - 48a^2b^2c^6 + 23ab^2c^6 + 11b^3c^6 + 4a^2c^7 - \\
& 44ab^2c^7 - 5b^2c^7 + 20ac^8)\operatorname{abs}(c))
\end{aligned}$$

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

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\text{atan}\left(\left(\tan(x/2)\cdot(57344a^4b - 57344ab^4 + 8192a^3c^4 + 8192a^4c^3 + 57344b^3c^4 - 57344b^4c^3 - 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(-4ac - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2(16a^2c^4 + b^4c^2 - 8ab^2c^3)\right)^{1/2} \cdot (32768ab^5 - 253952a^3c^5 - 24576a^5c^3 + 57344b^5c^5 + 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)\cdot(16384ab^6 - 81920a^3c^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^3c^4 - 180224a^2b^4c - 983040a^3b^3c^3 - 65536a^3b^3c + 49152a^4b^3c^2 + 98304a^4b^2c + 851968a^2b^2c^3 + 131072a^2b^3c^2 + 393216a^3b^2c^2 + 65536ab^3c^5 + 98304ab^5c) + (-8a^3c^3 + b(-4ac - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c\right) / \left(2(16a^2c^4 + b^4c^2 - 8ab^2c^3)\right)^{1/2} \cdot (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^3c^5 + 589824a^3b^3c^4 + 196608a^4b^3c^3 + 147456a^2b^2c^4 - 344064a^2b^3c^3 + 98304a^3b^2c^3 - 49152a^3b^3c^2 + 24576a^4b^2c^2 + 196608ab^3c^6 - \tan(x/2)\cdot(-8a^3c^3 + b(-4ac - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / \left(2(16a^2c^4 + b^4c^2 - 8ab^2c^3)\right)^{1/2} \cdot (65536a^8c^7 - 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^3c^6 + 720896a^3b^3c^5 - 65536a^4b^3c^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^3c^7) \cdot (-8a^3c^3 + b(-4ac - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / \left(2(16a^2c^4 + b^4c^2 - 8ab^2c^3)\right)^{1/2} + 147456ab^2c^3 - 458752ab^3c^2 + 802816a^2b^3c^3 - 245760a^2b^3c + 557056a^3b^3c^2 - 16384a^3b^2c + 98304a^2b^2c^2 + 425984ab^3c^4 + 106496ab^4c + 122880a^4b^3c) \cdot (-8a^3c^3 + b(-4ac - b^2)^3)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c) / \left(2(16a^2c^4 + b^4c^2 - 8ab^2c^3)\right)^{1/2} \cdot i + (\tan(x/2)\cdot(57344a^4b - 57344ab^4 + 8192a^3c^4 + 8192a^4c^3 + 57344b^3c^4 - 57344b^4c^3 - 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 - 442368a^2b^2c^2$

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



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



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

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

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

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

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

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

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

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

[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}

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

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

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[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



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

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

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

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

$$\begin{aligned}
&))^{(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)} * \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 * 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)} * \operatorname{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{arc} \\
&\operatorname{tanh}((-a+b-c) * \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)} - a+c) * (a-b+c))^{(1/2)}) * c * b^2 + 1 / \\
&(a+b+c) / (a-b+c)^2 / (((-4*a*c+b^2)^{(1/2)} - a+c) * (a-b+c))^{(1/2)} * \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)} * \operatorname{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{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)} * \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 / (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{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)} * \operatorname{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)} * \operatorname{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)} * \operatorname{arct} \\
&\operatorname{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)} * \operatorname{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] 
$$-(2*b*cos(2*x)*sin(x) + ((a^2 - b^2 + 2*a*c + c^2)*cos(2*x)^2 + (a^2 - b^2 + 2*a*c + c^2)*sin(2*x)^2 + a^2 - b^2 + 2*a*c + c^2 - 2*(a^2 - b^2 + 2*a*c + c^2)*cos(2*x))*integrate(2*(2*b^2*c*cos(3*x)^2 + 2*b^2*c*cos(x)^2 + 2*b^2*c*sin(3*x)^2 + 2*b^2*c*sin(x)^2 + b*c^2*cos(x) + 4*(2*a*b^2 - 3*a*c^2 - c^3 - (2*a^2 - b^2)*c)*cos(2*x)^2 + 4*(2*a*b^2 - 3*a*c^2 - c^3 - (2*a^2 - b^2)*c)*sin(2*x)^2 + 2*(2*b^3 - b*c^2)*sin(2*x)*sin(x) + (b*c^2*cos(3*x) + b*c^2*cos(x) + 2*(b^2*c - a*c^2 - c^3)*cos(2*x))*cos(4*x) + (4*b^2*c*cos(x) + b*c^2 + 2*(2*b^3 - b*c^2)*cos(2*x))*cos(3*x) + 2*(b^2*c - a*c^2 - c^3 + (2*b^3 - b*c^2)*cos(x))*cos(2*x) + (b*c^2*sin(3*x) + b*c^2*sin(x) + 2*(b^2*c - a*c^2 - c^3)*sin(2*x))*sin(4*x) + 2*(2*b^2*c*sin(x) + (2*b^3 - b*c^2)*sin(2*x))*sin(3*x))/(2*a*c^3 + c^4 + (a^2 - b^2)*c^2 + (2*a*c^3 + c^4 + (a^2 - b^2)*c^2)*cos(4*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*cos(3*x)^2 + 4*(4*a^4 - 4*a^2*b^2 + 6*a*c^3 + c^4 + (13*a^2 - b^2)*c^2 + 4*(3*a^3 - a*b^2)*c)*cos(2*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*cos(x)^2 + (2*a*c^3 + c^4 + (a^2 - b^2)*c^2)*sin(4*x)^2 + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*sin(3*x)^2 + 4*(4*a^4 - 4*a^2*b^2 + 6*a*c^3 + c^4 + (13*a^2 - b^2)*c^2 + 4*(3*a^3 - a*b^2)*c)*sin(2*x)^2 + 8*(2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + b*c^3 + (5*a^2*b - b^3)*c)*sin(2*x)*sin(x) + 4*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*sin(x)^2 + 2*(2*a*c^3 + c^4 + (a^2 - b^2)*c^2 + 2*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*cos(3*x) + 2*(4*a*c^3 + c^4 + (5*a^2 - b^2)*c^2 + 2*(a^3 - a*b^2)*c)*cos(2*x) + 2*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*cos(x))*cos(4*x) + 4*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c + 2*(2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + b*c^3 + (5*a^2*b - b^3)*c)*cos(2*x) + 2*(a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*cos(x))*cos(3*x) + 4*(4*a*c^3 + c^4 + (5*a^2 - b^2)*c^2 + 2*(a^3 - a*b^2)*c + 2*(2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + b*c^3 + (5*a^2*b - b^3)*c)*cos(x))*cos(2*x) + 4*(2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*cos(x) + 4*((2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*sin(3*x) + (4*a*c^3 + c^4 + (5*a^2 - b^2)*c^2 + 2*(a^3 - a*b^2)*c)*sin(2*x) + (2*a*b*c^2 + b*c^3 + (a^2*b - b^3)*c)*sin(x))*sin(4*x) + 8*((2*a^3*b - 2*a*b^3 + 4*a*b*c^2 + b*c^3 + (5*a^2*b - b^3)*c)*sin(2*x) + (a^2*b^2 - b^4 + 2*a*b^2*c + b^2*c^2)*sin(x))*sin(3*x)), x) - 2*(b*cos(x) - a - c)*sin(2*x) - 2*b*sin(x))/((a^2 - b^2 + 2*a*c + c^2)*cos(2*x)^2 + (a^2 - b^2 + 2*a*c + c^2)*sin(2*x)^2 + a^2 - b^2 + 2*a*c + c^2 - 2*(a^2 - b^2 + 2*a*c + c^2)*cos(2*x))$$

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] atan(((((-8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c))))^(1/2)*(128*a*c^13 - 64*a*b^13 - 32*b^13*c + 32*b^14 - 96*a^2*b^12 + 256*a^3*b^11 + 64*a^4*b^10 - 384*a^5*b^9 + 64*a^6*b^8 + 256*a^7*b^7 - 96*a^8*b^6 - 64*a^9*b^5 + 32*a^10*b^4 + 1408*a^2*c^12 + 7040*a^3*c^11 + 21120*a^4*c^10 + 42240*a^5*c^9 + 59136*a^6*c^8 + 59136*a^7*c^7 + 42240*a^8*c^6 + 21120*a^9*c^5 + 7040*a^10*c^4 + 1408*a^11*c^3 + 128*a^12*c^2 - 32*b^2*c^12 + 96*b^3*c^11 + 64*b^4*c^10 - 416*b^5*c^9 + 96*b^6*c^8 + 704*b^7*c^7 - 384*b^8*c^6 - 576*b^9*c^5 + 416*b^10*c^4 + 224*b^11*c^3 - 192*b^12*c^2 + tan(x/2)*(-8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c))))^(1/2)*(64*a*b^14 - 256*a*c^14 + 256*a^14*c - 64*b^14*c - 128*a^2*b^13 - 256*a^3*b^12 + 640*a^4*b^11 + 320*a^5*b^10 - 1280*a^6*b^9 + 1280*a^8*b^7 - 320*a^9*b^6 - 640*a^10*b^5 + 256*a^11*b^4 + 128*a^12*b^3 - 64*a^13*b^2 - 2816*a^2*c^13 - 13824*a^3*c^12 - 39424*a^4*c^11 - 70400*a^5*c^10 - 76032*a^6*c^9 - 33792*a^7*c^8 + 33792*a^8*c^7 + 76032*a^9*c^6 + 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 - 261
```

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

$$\begin{aligned}
& - 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} * 1i - ((- (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} - 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 +
\end{aligned}$$

$$\begin{aligned}
& b^4c^6 - 3b^6c^4 + 3b^8c^2 - 8a^2b^2c^7 + 30a^4b^4c^5 - 36a^6b^6c^3 \\
& - 36a^8b^8c + 30a^{10}b^{10}c - 8a^{12}b^{12}c - 96a^{14}b^{14}c^2 + 159a^{16}b^{16}c^4 \\
& *c^4 - 82a^{18}b^{18}c^2 - 312a^{20}b^{20}c^5 + 260a^{22}b^{22}c^3 - 448a^{24}b^{24}c^6 \\
& + 159a^{26}b^{26}c^2 - 312a^{28}b^{28}c^3 - 96a^{30}b^{30}c^2 + 14a^2b^8c))^{(1/2)} \\
& *(64a^2b^{14} - 256a^4c^{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^3b^3c^{11} - 3584a^4b^4c^{10} + 10240a^5b^5c^9 \\
& + 2240a^6b^6c^8 - 12800a^7b^7c^7 + 1280a^8b^8c^6 + 7680a^9b^9c^5 - 1984a^{10}b^{10}c^4 \\
& - 1792a^{11}b^{11}c^3 + 512a^{12}b^{12}c^2 + 5120a^{12}b^{12}c + 22528a^3b^3c^{11} + 1792a^3b^{11}c \\
& + 56320a^4b^4c^{10} + 1984a^4b^{10}c + 84480a^5b^5c^9 - 7680a^5b^9c + 67584a^6b^6c^8 \\
& - 1280a^6b^8c + 12800a^7b^7c - 67584a^8b^8c^6 - 2240a^8b^6c - 84480a^9b^5c^5 \\
& - 10240a^9b^5c - 56320a^{10}b^4c^4 + 3584a^{10}b^4c - 22528a^{11}b^3c^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 + 38400a^6b^7c^2 - 51456a^7b^2c^6 + 124416a^7b^3c^5 + 58880a^7b^4c^4 \\
& - 102400a^7b^5c^3 - 6400a^7b^6c^2 - 11168a^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^3b^3c^{10} + 224a^4b^4c^9 - 6208a^5b^5c^8 + 2112a^6b^6c^7 + 6784a^7b^7c^6 \\
& - 3520a^8b^8c^5 - 3584a^9b^9c^4 + 2080a^{10}b^{10}c^3 + 832a^{11}b^{11}c^2 - 3840a^{12}b^{12}c \\
& + 992a^{12}b^{12}c - 17280a^3b^3c^{10} + 992a^3b^{10}c - 46080a^4b^4c^9 - 3136a^4b^9c \\
& - 80640a^5b^5c^8 - 320a^5b^8c - 96768a^6b^6c^7 + 3776a^6b^7c - 80640a^7b^7c^6 - 832 \\
& a^7b^6c - 46080a^8b^8c^5 - 1952a^8b^5c - 17280a^9b^9c^4 + 736a^9b^4c - 3840a^{10}b^4c^3 \\
& + 352a^{10}b^3c - 384a^{11}b^3c^2 - 160a^{11}b^2c - 4192a^{12}b^2c^{10} + 17888a^{12}b^3c^9 \\
& + 288a^{12}b^4c^8 - 30080a^{12}b^5c^7 + 8768a^{12}b^6c^6 + 22848a^{12}b^7c^5 - 8768a^{12}b^8c^4 \\
& - 7808a^{12}b^9c^3 + 2592a^{12}b^{10}c^2 - 15648a^{13}b^2c^9 + 60160a^{13}b^3c^8 + 1152a^{13}b^4c^7 \\
& - 73472a^{13}b^5c^6 + 15424a^{13}b^6c^5 + 37888a^{13}b^7c^4 - 8960a^{13}b^8c^3 - 7552a^{13}b^9c^2 \\
& - 36672a^{14}b^2c^8 + 120512a^{14}b^3c^7 + 5
\end{aligned}$$



$$\begin{aligned}
& 376a^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^5b^8c \\
& + 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^ \\
& - 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^*c^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)*1i)/(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 + 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))
\end{aligned}$$

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

$$\begin{aligned}
&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^*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 - 832a^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 + 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
\end{aligned}$$

$$\begin{aligned}
& - 22400*a^6*b^2*c^5 - 7552*a^6*b^3*c^4 + 12160*a^6*b^4*c^3 - 640*a^6*b^5*c^2 - 10368*a^7*b^2*c^4 - 1280*a^7*b^3*c^3 + 2560*a^7*b^4*c^2 - 2656*a^8*b^2*c^3 - 32*a^8*b^3*c^2 - 288*a^9*b^2*c^2 + 1280*a*b*c^11 + 320*a*b^11*c)) * (- \\
& (8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^{1/2} - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 \\
& + 3*b*c^4*(-(4*a*c - b^2)^3)^{1/2} - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^{1/2} - 10*a*b^6*c + 3*a^2*b*c^2 * \\
& (-(4*a*c - b^2)^3)^{1/2} + 6*a*b*c^3*(-(4*a*c - b^2)^3)^{1/2} - 4*a*b^3*c*(-(4*a*c - b^2)^3)^{1/2}) / (2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + \\
& 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 \\
& + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c))^{1/2} + (((- (8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + \\
& b^5*(-(4*a*c - b^2)^3)^{1/2} - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4*(-(4*a*c - b^2)^3)^{1/2} - 54*a^2*b^2*c^4 + 3 \\
& 3*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2*(-(4*a*c - b^2)^3)^{1/2} - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{1/2} + 6*a*b*c^3*(-(4*a*c - b^2)^3)^{1/2} - 4*a*b^3*c*(-(4*a*c - b^2)^3)^{1/2}) / (2*(3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96 \\
& *a^6*b^2*c^2 + 14*a*b^8*c))^{1/2} * (128*a*c^13 - 64*a*b^13 - 32*b^13*c + 32 \\
& *b^14 - 96*a^2*b^12 + 256*a^3*b^11 + 64*a^4*b^10 - 384*a^5*b^9 + 64*a^6*b^8 \\
& + 256*a^7*b^7 - 96*a^8*b^6 - 64*a^9*b^5 + 32*a^10*b^4 + 1408*a^2*c^12 + 70 \\
& 40*a^3*c^11 + 21120*a^4*c^10 + 42240*a^5*c^9 + 59136*a^6*c^8 + 59136*a^7*c^7 + 42240*a^8*c^6 + 21120*a^9*c^5 + 7040*a^10*c^4 + 1408*a^11*c^3 + 128*a^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 - 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 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c))^{1/2} * (64*a*b^14 - 256*a*c^14 + 256*a^14*c - 64*b^14*c - 128*a^2*b^13 - 256*a^3*b^12 + 640*a^4*b^11 + 320*a^5*b^10 -
\end{aligned}$$

$$\begin{aligned}
& 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 \\
& ^9 + 288*a^2*b^4*c^8 - 30080*a^2*b^5*c^7 + 8768*a^2*b^6*c^6 + 22848*a^2*b^7 \\
& *c^5 - 8768*a^2*b^8*c^4 - 7808*a^2*b^9*c^3 + 2592*a^2*b^{10}*c^2 - 15648*a^3* \\
& b^2*c^9 + 60160*a^3*b^3*c^8 + 1152*a^3*b^4*c^7 - 73472*a^3*b^5*c^6 + 15424* \\
& a^3*b^6*c^5 + 37888*a^3*b^7*c^4 - 8960*a^3*b^8*c^3 - 7552*a^3*b^9*c^2 - 366 \\
& 72*a^4*b^2*c^8 + 120512*a^4*b^3*c^7 + 5376*a^4*b^4*c^6 - 104384*a^4*b^5*c^5 \\
& + 12800*a^4*b^6*c^4 + 34112*a^4*b^7*c^3 - 3712*a^4*b^8*c^2 - 57792*a^5*b^2 \\
& *c^7 + 155008*a^5*b^3*c^6 + 12096*a^5*b^4*c^5 - 90496*a^5*b^5*c^4 + 3776*a^ \\
& 5*b^6*c^3 + 16512*a^5*b^7*c^2 - 63168*a^6*b^2*c^6 + 131264*a^6*b^3*c^5 + 14 \\
& 784*a^6*b^4*c^4 - 47488*a^6*b^5*c^3 - 1088*a^6*b^6*c^2 - 48192*a^7*b^2*c^5 \\
& + 72448*a^7*b^3*c^4 + 10368*a^7*b^4*c^3 - 14080*a^7*b^5*c^2 - 25248*a^8*b^2
\end{aligned}$$

$$\begin{aligned}
& *c^4 + 24800*a^8*b^3*c^3 + 4032*a^8*b^4*c^2 - 8672*a^9*b^2*c^3 + 4672*a^9*b^3*c^2 - 1760*a^10*b^2*c^2 - 384*a*b*c^12 - 416*a*b^12*c) - \tan(x/2)*(32*a*b^12 - 512*a*c^12 + 128*b*c^12 + 96*b^12*c - 32*b^13 - 64*c^13 + 96*a^2*b^11 - 96*a^3*b^10 - 96*a^4*b^9 + 96*a^5*b^8 + 32*a^6*b^7 - 32*a^7*b^6 - 1728*a^2*c^11 - 3072*a^3*c^10 - 2688*a^4*c^9 + 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 + 4800*a^3*b^8*c^2 - 22848*a^4*b^2*c^7 - 30400*a^4*b^3*c^6 + 39680*a^4*b^4*c^5 + 6272*a^4*b^5*c^4 - 16544*a^4*b^6*c^3 + 1824*a^4*b^7*c^2 - 29120*a^5*b^2*c^6 - 20224*a^5*b^3*c^5 + 29184*a^5*b^4*c^4 + 384*a^5*b^5*c^3 - 5856*a^5*b^6*c^2 - 22400*a^6*b^2*c^5 - 7552*a^6*b^3*c^4 + 12160*a^6*b^4*c^3 - 640*a^6*b^5*c^2 - 10368*a^7*b^2*c^4 - 1280*a^7*b^3*c^3 + 2560*a^7*b^4*c^2 - 2656*a^8*b^2*c^3 - 32*a^8*b^3*c^2 - 288*a^9*b^2*c^2 + 1280*a*b*c^11 + 320*a*b^11*c)) * (- (8*a*c^7 + b^8 + 24*a^2*c^6 + 24*a^3*c^5 + 8*a^4*c^4 + b^5 * (- (4*a*c - b^2)^3)^(1/2) - 2*b^2*c^6 + 3*b^4*c^4 - 3*b^6*c^2 - 18*a*b^2*c^5 + 24*a*b^4*c^3 + 3*b*c^4 * (- (4*a*c - b^2)^3)^(1/2) - 54*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 3*b^3*c^2 * (- (4*a*c - b^2)^3)^(1/2) - 10*a*b^6*c + 3*a^2*b*c^2 * (- (4*a*c - b^2)^3)^(1/2) + 6*a*b*c^3 * (- (4*a*c - b^2)^3)^(1/2) - 4*a*b^3*c * (- (4*a*c - b^2)^3)^(1/2)) / (2 * (3*a^2*b^8 - b^10 - 3*a^4*b^6 + a^6*b^4 + 16*a^2*c^8 + 96*a^3*c^7 + 240*a^4*c^6 + 320*a^5*c^5 + 240*a^6*c^4 + 96*a^7*c^3 + 16*a^8*c^2 + b^4*c^6 - 3*b^6*c^4 + 3*b^8*c^2 - 8*a*b^2*c^7 + 30*a*b^4*c^5 - 36*a*b^6*c^3 - 36*a^3*b^6*c + 30*a^5*b^4*c - 8*a^7*b^2*c - 96*a^2*b^2*c^6 + 159*a^2*b^4*c^4 - 82*a^2*b^6*c^2 - 312*a^3*b^2*c^5 + 260*a^3*b^4*c^3 - 448*a^4*b^2*c^4 + 159*a^4*b^4*c^2 - 312*a^5*b^2*c^3 - 96*a^6*b^2*c^2 + 14*a*b^8*c))^(1/2) + 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
\end{aligned}$$

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

$$\begin{aligned}
& ^{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^2*c^{11} + 22528*a^3*b*c^{11} + 1792*a^3*b^2*c^{10} + 56320*a^4*b*c^{10} + 1984*a^4*b^2*c^9 + 84480*a^5*b*c^9 - 7680*a^5*b^2*c^8 + 67584*a^6*b*c^8 - 1280*a^6*b^2*c^7 + 12800*a^7*b*c^7 - 67584*a^8*b*c^6 - 2240*a^8*b^2*c^5 - 84480*a^9*b*c^5 - 10240*a^9*b^2*c^4 - 56320*a^{10}*b*c^4 + 3584*a^{10}*b^2*c^3 - 22528*a^{11}*b*c^3 + 3840*a^{11}*b^2*c^2 - 5120*a^{12}*b*c^2 - 1728*a^{12}*b^2*c + 12672*a^2*b^2*c^{11} - 26112*a^2*b^3*c^{10} - 17920*a^2*b^4*c^9 + 48000*a^2*b^5*c^8 + 6400*a^2*b^6*c^7 - 38400*a^2*b^7*c^6 + 3840*a^2*b^8*c^5 + 11520*a^2*b^9*c^4 - 1664*a^2*b^{10}*c^3 + 45696*a^3*b^2*c^{10} - 83200*a^3*b^3*c^9 - 44800*a^3*b^4*c^8 + 102400*a^3*b^5*c^7 + 8960*a^3*b^6*c^6 - 43520*a^3*b^7*c^5 + 2560*a^3*b^8*c^4 + 1664*a^3*b^{10}*c^2 + 94400*a^4*b^2*c^9 - 144000*a^4*b^3*c^8 - 58880*a^4*b^4*c^7 + 98560*a^4*b^5*c^6 + 4480*a^4*b^6*c^5 - 2560*a^4*b^8*c^3 - 11520*a^4*b^9*c^2 + 111168*a^5*b^2*c^8 - 124416*a^5*b^3*c^7 - 28672*a^5*b^4*c^6 - 4480*a^5*b^6*c^4 + 43520*a^5*b^7*c^3 - 3840*a^5*b^8*c^2 + 51456*a^6*b^2*c^7 + 28672*a^6*b^4*c^5 - 98560*a^6*b^5*c^4 - 8960*a^6*b^6*c^3 + 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 - 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^2*c^{10} - 17280*a^3*b*c^{10} + 992*a^3*b^2*c^9 - 46080*a^4*b*c^9 - 3136*a^4*b^2*c^8 - 80640*a^5*b*c^8 - 320*a^5*b^2*c^7 - 96768*a^6*b*c^7 + 3776*a^6*b^2*c^6 - 80640*a^7*b*c^6 - 832*a^7*b^2*c^5 - 46080*a^8*b*c^5 - 1952*a^8*b^2*c^4 + 736*a^9*b^2*c^4 - 3840*a^{10}*b*c^3 + 352*a^{10}*b^2*c^3 - 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 + 5376*a^4*b^4*c^6 - 104384*a^4*b^5*c^5 + 12800*a^4*b^6*c^4 + 34112*a^4*b^7*c^3 - 3712*a^4*b^8*c^2 - 57792*a^5*b^2*c^7 + 155008*a^5*b^3*c^6 + 12096*a^5*b^4*c^5 - 90496*a^5*b^5*c^4 + 3776*a^5*b^6*c^3 + 16512*a^5*b^7*c^2 - 63168*a^6*b^2*c^6 + 131264*a^6*b^3*c^5 + 14784*a^6*b^4*c^4 - 47488*a^6*b^5*c^3 - 1088*a^6*b^6*c^2 - 48192*a^7*b^2*c^5 + 72448*a^7*b^3*c^4 + 10368*a^7*b^4*c^3 - 14080*a^7*b^5*c^2 - 25248*a^8*b^2*c^4 + 24800*a^8*b^3*c^3 + 4032*a^8*b^4*c^2 - 8672*a^9*b^2*c^3 + 4672*a^9*b^3*c^2 - 1760*a^{10}*b^2*c^2 - 384*a*b*c^{12} - 416*a*b^{12}*c) + \tan(x/2)*(32*a*b^{12} - 512*a*c^{12} + 128*b*c^{12} + 96*b^{12}*c - 32*b^{13} - 64*c^{13} + 96*a^2*b^{11} - 96*a^3*b^{10} - 96*a^4*b^9 + 96*a^5*b^8 + 32*a^6*b^7 - 32*a^7*b^6 - 1728*a^2*c^{11} - 3072*a^3*c^{10} - 2688*a^4*c^9
\end{aligned}$$





$$\begin{aligned}
& 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^8c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 \cdot (-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 \cdot (-4ac - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 \cdot (-4ac - b^2)^3)^{(1/2)} - 10a^2b^6c - 3a^2b^2c^2 \cdot (-4ac - b^2)^3)^{(1/2)} - 6a^2b^3c \cdot (-4ac - b^2)^3)^{(1/2)} + 4a^2b^3c \cdot (-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)} \cdot (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 - 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 -
\end{aligned}$$

$$\begin{aligned}
& 3840a^2b^2c^{11} + 992a^2b^{11}c - 17280a^3b^2c^{10} + 992a^3b^{10}c - 46080a^4b^2c^9 - 3136a^4b^9c - 80640a^5b^2c^8 - 320a^5b^8c - 96768a^6b^2c^7 + 3776a^6b^7c - 80640a^7b^2c^6 - 832a^7b^6c - 46080a^8b^2c^5 - 1952a^8b^5c - 17280a^9b^2c^4 + 736a^9b^4c - 3840a^{10}b^2c^3 + 352a^{10}b^3c - 384a^{11}b^2c^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 + 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^2b^2c^{12} - 416a^2b^{12}c) - \tan(x/2) \\
& * (32a^2b^{12} - 512a^2c^{12} + 128b^2c^{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^2b^2c^{10} - 4352a^2b^3c^9 + 2560a^2b^4c^8 + 5248a^2b^5c^7 - 5664a^2b^6c^6 - 2240a^2b^7c^5 + 4320a^2b^8c^4 - 256a^2b^9c^3 - 1216a^2b^{10}c^2 + 5632a^2b^2c^{10} - 672a^2b^2c^{10} + 14336a^3b^2c^9 - 768a^3b^9c + 23296a^4b^2c^8 + 1248a^4b^8c + 25088a^5b^2c^7 + 576a^5b^7c + 17920a^6b^2c^6 - 864a^6b^6c + 8192a^7b^2c^5 - 128a^7b^5c + 2176a^8b^2c^4 + 192a^8b^4c + 256a^9b^2c^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^2b^2c^{11} + 320a^2b^{11}c) * (- (8a^2c^7 + b^8 + 24a^2c^6 + 24a^3c^5 + 8a^4c^4 - b^5 * (- (4a^2c - 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 - b^2)^3)^{(1/2)} - 54a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + 3b^3c^2 * (- (4a^2c - b^2)^3)^{(1/2)} - 10a^2b^6c - 3a^2b^2c^2 * (- (4a^2c - b^2)^3)^{(1/2)} - 6a^2b^3c * (- (4a^2c - b^2)^3)^{(1/2)} + 4a^2b^3c * (- (4a^2c - 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 -
\end{aligned}$$

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

$$\begin{aligned}
& + 1984a^4b^{10}c + 84480a^5b^9c^9 - 7680a^5b^9c + 67584a^6b^8c^8 - 1280a^6b^8c + 12800a^7b^7c^9 - 67584a^8b^6c^6 - 2240a^8b^6c - 84480a^9b^5c^5 - 10240a^9b^5c - 56320a^{10}b^4c^4 + 3584a^{10}b^4c - 22528a^{11}b^3c^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 + 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^*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 - 832a^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 + 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 + 143
\end{aligned}$$



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

$$\begin{aligned}
& a^2b^5c^7 + 8768a^2b^6c^6 + 22848a^2b^7c^5 - 8768a^2b^8c^4 - 780 \\
& 8a^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 \\
& + 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 + 1 \\
& 2096a^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 + 40 \\
& 32a^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} - 26 \\
& 88a^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^6 \\
& *c^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 - 5664 \\
& a^*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^6 \\
& b^*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 + 1 \\
& 3440a^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 - 2912 \\
& 0a^5b^2c^6 - 20224a^5b^3c^5 + 29184a^5b^4c^4 + 384a^5b^5c^3 - 5 \\
& 856a^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} + 32 \\
& 0a^*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^2 \\
& *b^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)} + 1792a^2c^{10} + 3584a^3c^9 + 4480a^4c^8 \\
& + 3584a^5c^7 + 1792a^6c^6 + 512a^7c^5 + 64a^8c^4 - 320b^2c^{10} +
\end{aligned}$$



```

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

```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

**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], 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], 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)^(p\_), 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] && Intege
rQ[(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] - 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*atan(cos(x)/3 - 2/3)/(54*cos(x)**2 - 216*cos(x) + 702) + 4*cos(x)
)*atan(cos(x)/3 - 2/3)/(54*cos(x)**2 - 216*cos(x) + 702) - 3*cos(x)/(54*cos
(x)**2 - 216*cos(x) + 702) - 13*atan(cos(x)/3 - 2/3)/(54*cos(x)**2 - 216*co
s(x) + 702) + 6/(54*cos(x)**2 - 216*cos(x) + 702)
```

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

**Optimal.** Leaf size=326

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

[Out]  $\frac{1}{2} \frac{x}{c} + \frac{(-a+c+b^2)x/c^3 - b \sin(x)/c^2 + 1/2 \cos(x) \sin(x)/c - 2 \arctan((b-2c - (-4ac+b^2)^{1/2})^{1/2}) \tan(x/2)}{(b+2c - (-4ac+b^2)^{1/2})^{1/2}} \cdot \frac{(b^3 - 2ab^2c + (-2a^2c^2 + 4ab^2c - b^4)/(-4ac+b^2)^{1/2})/c^3}{(b-2c - (-4ac+b^2)^{1/2})^{1/2}} - \frac{2 \arctan((b-2c + (-4ac+b^2)^{1/2})^{1/2}) \tan(x/2)}{(b+2c + (-4ac+b^2)^{1/2})^{1/2}} \cdot \frac{(b^3 - 2ab^2c + (2a^2c^2 - 4ab^2c + b^4)/(-4ac+b^2)^{1/2})/c^3}{(b-2c + (-4ac+b^2)^{1/2})^{1/2}}$

**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}

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

Antiderivative was successfully verified.

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

[Out]  $\frac{x}{2c} + \frac{(b^2 - ac)x/c^3 - (2(b^3 - 2ab^2c - (b^4 - 4ab^2c + 2a^2c^2)/\sqrt{b^2 - 4ac}) \operatorname{ArcTan}[(\sqrt{b - 2c - \sqrt{b^2 - 4ac}}) \tan(x/2)]/\sqrt{b + 2c - \sqrt{b^2 - 4ac}})}{(c^3 \sqrt{b - 2c - \sqrt{b^2 - 4ac}}) \sqrt{b + 2c - \sqrt{b^2 - 4ac}}} - \frac{(2(b^3 - 2ab^2c + (b^4 - 4ab^2c + 2a^2c^2)/\sqrt{b^2 - 4ac}) \operatorname{ArcTan}[(\sqrt{b - 2c + \sqrt{b^2 - 4ac}}) \tan(x/2)]/\sqrt{b + 2c + \sqrt{b^2 - 4ac}})}{(c^3 \sqrt{b - 2c + \sqrt{b^2 - 4ac}}) \sqrt{b + 2c + \sqrt{b^2 - 4ac}}} - \frac{(b \sin(x))/c^2 + (\cos(x) \sin(x))/c}{2c}$

**Rule 8**

Int[a\_, x\_Symbol] := Simp[a\*x, x] /; FreeQ[a, x]

**Rule 205**

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

### Rule 2635

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

### Rule 2637

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

### Rule 2659

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

### Rule 3257

```
Int[cos[(d_) + (e_)*(x_)]^(m_)*((a_) + cos[(d_) + (e_)*(x_)]^(n_)*(b
_) + cos[(d_) + (e_)*(x_)]^(2*n_)*(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



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

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

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

Antiderivative was successfully verified.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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





$$\begin{aligned} & \left( \frac{3b^2 + 2ab^4}{c^{13}} - (a^4b^2 - 2a^2b^4 + b^6)c^{12} \right) / (4ac^9 + (8a^2 - b^2)c^8 + 2(2a^3 - 3ab^2)c^7 - (a^2b^2 - b^4)c^6) \cdot \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})) \cdot \cos(x) - 2(a^6b^5 - a^4b^7)c - 1/2 \sqrt{2} \cdot ((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})) \cdot \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) \cdot \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})) / (4ac^9 + (8a^2 - b^2)c^8 + 2(2a^3 - 3ab^2)c^7 - (a^2b^2 - b^4)c^6) - (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) \cdot \cos(x) + 2(2b^2 - 2ac + c^2)x + 2(c^2 \cos(x) - 2bc) \cdot \sin(x) / c^3 \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)^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]  $\text{int}(\cos(x)^4/(a+b*\cos(x)+c*\cos(x)^2), x)$

[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)*\operatorname{t} \\ & \operatorname{an}(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)})*b^4+2/c/(-4*a*c+b^2)^{(1/2)} \\ & / (a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\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)}+ \\ & )) \end{aligned}$$

$$\begin{aligned}
& a-c)*(a-b+c))^{(1/2)})*a^3+1/c^2/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)} \\
& * \arctanh((-a+b-c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)})* \\
& a*b^2+1/c^2/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c) \\
& *\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*a*b^2+2/c^3*a/(a-b+c) \\
& /((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x)/((( -4 \\
& *a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)})*b^3-2/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4 \\
& *a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x)/((( -4*a*c+b^2 \\
& )^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*a^2+1/c^2/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a \\
& -b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c)) \\
& ^{(1/2)})*b^3+1/c/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((- \\
& a+b-c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)})*a^2+1/c^2/(a-b+ \\
& c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x)/((( -4 \\
& *a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*a^3-1/c^3/(a-b+c)/((( -4*a*c+b^2)^{(1/2) \\
& +a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a \\
& -b+c))^{(1/2)})*b^4+1/c^2/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\ar \\
& ctan((a-b+c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*b^3+1/c^2 \\
& / (a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2* \\
& x)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)})*a^3+2/(-4*a*c+b^2)^{(1/2)}/(a-b+ \\
& c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x)/((( \\
& -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)})*a^2-1/c^3/(a-b+c)/((( -4*a*c+b^2)^{(1/ \\
& 2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a+c \\
& )*(a-b+c))^{(1/2)})*b^4+4/c/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a \\
& -c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b \\
& +c))^{(1/2)})*a*b^2+1/c/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arct \\
& an((a-b+c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*a^2+1/c^3/( \\
& -4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan(( \\
& a-b+c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*a^2*b^3-4/c/(-4 \\
& *a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((- \\
& a+b-c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)})*a*b^2+7/c^2/(-4 \\
& *a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a- \\
& b+c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*a^2*b^2-3/c^2/(-4 \\
& *a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a- \\
& b+c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*a^3*b-1/c^3/(-4*a \\
& *c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+ \\
& b-c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)})*a^2*b^3+2/c^3*a/( \\
& a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x)/(( \\
& (-4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)})*b^3-1/c^3/(a-b+c)/((( -4*a*c+b^2)^{(1/ \\
& 2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x)/((( -4*a*c+b^2)^{(1/2)}-a \\
& +c)*(a-b+c))^{(1/2)})*b^2*a^2-1/c/( \tan(1/2*x)^2+1)^2*\tan(1/2*x)^3+1/c/( \tan(1/ \\
& 2*x)^2+1)^2*\tan(1/2*x)-2/c^2*\arctan(\tan(1/2*x))*a+2/c^3*\arctan(\tan(1/2*x))* \\
& b^2
\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} \cdot (4c^3 \cdot \text{integrate}(-2 \cdot (2(b^4 - 2ab^2c) \cdot \cos(3x))^2 + 4 \cdot (2a^2b^2 - a^2c^2 - (2a^3 - ab^2)c) \cdot \cos(2x))^2 + 2 \cdot (b^4 - 2ab^2c) \cdot \cos(x))^2 + 2 \cdot (b^4 - 2ab^2c) \cdot \sin(3x))^2 + 4 \cdot (2a^2b^2 - a^2c^2 - (2a^3 - ab^2)c) \cdot \sin(2x))^2 + 2 \cdot (4ab^3 - 2ab^2c - (6a^2b - b^3)c) \cdot \sin(2x) \cdot \sin(x) + 2 \cdot (b^4 - 2ab^2c) \cdot \sin(x))^2 + ((b^3c - 2ab^2c^2) \cdot \cos(3x) + 2 \cdot (ab^2c - a^2c^2) \cdot \cos(2x) + (b^3c - 2ab^2c^2) \cdot \cos(x)) \cdot \cos(4x) + (b^3c - 2ab^2c^2 + 2 \cdot (4ab^3 - 2ab^2c - (6a^2b - b^3)c) \cdot \cos(2x) + 4 \cdot (b^4 - 2ab^2c) \cdot \cos(x)) \cdot \cos(3x) + 2 \cdot (ab^2c - a^2c^2 + (4ab^3 - 2ab^2c - (6a^2b - b^3)c) \cdot \cos(x)) \cdot \cos(2x) + (b^3c - 2ab^2c^2) \cdot \cos(x) + ((b^3c - 2ab^2c^2) \cdot \sin(3x) + 2 \cdot (ab^2c - a^2c^2) \cdot \sin(2x) + (b^3c - 2ab^2c^2) \cdot \sin(x)) \cdot \sin(4x) + 2 \cdot ((4ab^3 - 2ab^2c - (6a^2b - b^3)c) \cdot \sin(2x) + 2 \cdot (b^4 - 2ab^2c) \cdot \sin(x)) \cdot \sin(3x)) / (c^5 \cdot \cos(4x))^2 + 4 \cdot b^2 \cdot c^3 \cdot \cos(3x))^2 + 4 \cdot b^2 \cdot c^3 \cdot \cos(x))^2 + c^5 \cdot \sin(4x))^2 + 4 \cdot b^2 \cdot c^3 \cdot \sin(3x))^2 + 4 \cdot b^2 \cdot c^3 \cdot \sin(x))^2 + 4 \cdot b \cdot c^4 \cdot \cos(x) + c^5 + 4 \cdot (4a^2c^3 + 4ac^4 + c^5) \cdot \cos(2x))^2 + 4 \cdot (4a^2c^3 + 4ac^4 + c^5) \cdot \sin(2x))^2 + 8 \cdot (2ab^2c^3 + b^2c^4) \cdot \sin(2x) \cdot \sin(x) + 2 \cdot (2b^2c^4 \cdot \cos(3x) + 2b^2c^4 \cdot \cos(x) + c^5 + 2 \cdot (2ac^4 + c^5) \cdot \cos(2x)) \cdot \cos(4x) + 4 \cdot (2b^2c^3 \cdot \cos(x) + b^2c^4 + 2 \cdot (2ab^2c^3 + b^2c^4) \cdot \cos(2x)) \cdot \cos(3x) + 4 \cdot (2ac^4 + c^5 + 2 \cdot (2ab^2c^3 + b^2c^4) \cdot \cos(x)) \cdot \cos(2x) + 4 \cdot (b^2c^4 \cdot \sin(3x) + b^2c^4 \cdot \sin(x) + (2ac^4 + c^5) \cdot \sin(2x)) \cdot \sin(4x) + 8 \cdot (b^2c^3 \cdot \sin(x) + (2ab^2c^3 + b^2c^4) \cdot \sin(2x)) \cdot \sin(3x)), x) + c^2 \cdot \sin(2x) - 4 \cdot b \cdot c \cdot \sin(x) + 2 \cdot (2b^2 - 2ac + c^2) \cdot x) / c^3$

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $\text{atan}(\frac{((2048 \cdot (12a^3c^{11} - 28a^4c^{10} - 44a^5c^9 + 72a^6c^8 + 88a^7c^7 + 12a^8c^6 + b^5c^9 - 4b^6c^8 + 10b^7c^7 - 20b^8c^6 + 29b^9c^5 - 30b^{10}c^4 + 26b^{11}c^3 - 12b^{12}c^2 - 6ab^3c^{10} + 27ab^4c^9 - 72ab^5c^8 + 154ab^6c^7 - 238ab^7c^6 + 251ab^8c^5 - 228ab^9c^4 + 98ab^{10}c^3 + 20ab^{11}c^2 + 8a^2b^2c^{11} - 68a^3b^2c^{10} + 112a^4b^2c^9 + 100a^5b^2c^8 - 200a^6b^2c^7 - 96a^7b^2c^6 - 47a^2b^2c^{10} + 145a^2b^3c^9 - 354a^2b^4c^8 + 612a^2b^5c^7 - 655a^2b^6c^6 + 635a^2b^7c^5 - 202a^2b^8c^4 - 222a^2b^9c^3 + 4a^2b^{10}c^2 + 239a^3b^2c^9 - 524a^3b^3c^8 + 536a^3b^4c^7 - 564a^3b^5c^6 - 115a^3b^6c^5 + 856a^3b^7c^4 + 2a^3b^8c^3 - 20a^3b^9c^2 - 37a^4b^2c^8 + 9a^4b^3c^7 + 583a^4b^4c^6 - 1362a^4b^5c^5 - 152a^4b^6c^4 + 156a^4b^7c^3 + 8a^4b^8c^2 - 399a^5b^2c^7 + 904a^5b^3c^6 + 394a^5$



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

$$\begin{aligned}
& 38a^5b^2c^3 + 12a^4b^8c + 4a^3b^4c^3(-4ac - b^2)^3)^{(1/2)} - 4a^3b^3c^3(-4ac - b^2)^3)^{(1/2)} + 3a^4b^4c^2(-4ac - b^2)^3)^{(1/2)} - 10a^2b^3c^2(-4ac - b^2)^3)^{(1/2)} + 6a^4b^5c^2(-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^4b^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^4b^8c + 4a^3b^4c^3(-4ac - b^2)^3)^{(1/2)} - 4a^3b^3c^3(-4ac - b^2)^3)^{(1/2)} + 3a^4b^4c^2(-4ac - b^2)^3)^{(1/2)} - 10a^2b^3c^2(-4ac - b^2)^3)^{(1/2)} + 6a^4b^5c^2(-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^4b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{(1/2)} - (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^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 - 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^2b^{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^4b^8c + 4a^3b^4c^3(-4ac - b^2)^3)^{(1/2)} - 4a^3b^3c^3(-4ac - b^2)^3)^{(1/2)} + 3a^4b^4c^2(-4ac - b^2)^3)^{(1/2)} - 10a^2b^3c^2(-4ac - b^2)^3)^{(1/2)} + 6a^4b^5c^2(-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^4b^4c^7 - 32a^2b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{(1/2)} * 1i - (((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^2c^{11} - 68a^3b^2c^{10} + 112a^4b^2c^9 + 100a^5b^2c^8 - 200a^6b^2c^7 - 96a^7b^2c^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 + 8
\end{aligned}$$



$$\begin{aligned}
& *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 \\
& 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*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 - 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*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 + (((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^1 \\
& 0*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*
\end{aligned}$$

$$\begin{aligned}
& b^{10}c^3 + 20a^5b^11c^2 + 8a^2b^11c^2 + 8a^2b^11c^2 - 68a^3b^11c^2 + 112a^4b^11c^2 + 1 \\
& 00a^5b^11c^2 - 200a^6b^11c^2 - 96a^7b^11c^2 - 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^10c^2 + 239a^3b^2c^9 - 524a^3b^3c^8 + 536a^3b^4c^7 - 564a^3b^5c^6 - 115a^3b^6c^5 + 856 \\
& a^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^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^2c^13 \\
& - 352a^4b^2c^12 - 144a^5b^2c^11 - 204a^6b^2c^10 + 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*(-(4a^2c - b^2)^3)^{(1/2)} - 10a^3b^6c + a^2b^5*(-(4a^2c - 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^2b^8c + 4a^3b^2c^3*(-(4a^2c - b^2)^3)^{(1/2)} - 4a^3b^3c*(-(4a^2c - b^2)^3)^{(1/2)} + \\
& 3a^4b^2c^2*(-(4a^2c - b^2)^3)^{(1/2)} - 10a^2b^3c^2*(-(4a^2c - b^2)^3)^{(1/2)} + 6a^2b^5c*(-(4a^2c - b^2)^3)^{(1/2)))/(2*(16a^2c^10 + 32a^3c^9 + 1 \\
& 6a^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)}*(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)*(-(a^2b^8 - b^10 + 8a^5c^5 + 8a^6c^4 \\
& - b^7*(-(4a^2c - b^2)^3)^{(1/2)} - 10a^3b^6c + a^2b^5*(-(4a^2c - 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^2b^8c + 4a^3b^2c^3*(-(4a^2c - b^2)^3)^{(1/2)} - 4a^3b^3c*(-(4a^2c - b^2)^3)^{(1/2)} + 3a^4b^2c^2*(-(4a^2c - b^2)^3)^{(1/2)} - \\
& 10a^2b^3c^2*(-(4a^2c - b^2)^3)^{(1/2)} + 6a^2b^5c*(-(4a^2c - 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)*(8a^2c^14 - 64a^2c^13 + 80a^3c^12 + 168a^4c^11 - 19 \\
& 2a^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^10c^5 \\
& + 8b^11c^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^10c^4 + 184a^2b^2c^12 - 328a^3b^2c^11 - 16a^4b^2c^10 + 496a^5b^2c^9 - 88a^6b^2c^8 - 416a^2b^2c^11 + 770a^2b^3c^10 - 723a^2b^4c^
\end{aligned}$$

$$\begin{aligned}
& 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 * (- (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^3c^2 * (- (4ac - b^2)^3)^{1/2} - 10a^2b^3c^2 * (- (4ac - b^2)^3)^{1/2} + 6a^6b^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^3c^2 * (- (4ac - b^2)^3)^{1/2} - 10a^2b^3c^2 * (- (4ac - b^2)^3)^{1/2} + 6a^6b^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^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^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 - 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 * (- (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^3c^2 * (- (4ac - b^2)^3)^{1/2} - 10a^2b^3c^2 * (- (4ac - b^2)^3)^{1/2} + 6a^6b^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 * (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
\end{aligned}$$

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







$$\begin{aligned}
& ((4ac - b^2)^3)^{1/2} - 10a^2b^3c^2(-4ac - b^2)^3)^{1/2} + 6ab^5c^* \\
& c(-4ac - b^2)^3)^{1/2}) / (2(16a^2c^{10} + 32a^3c^9 + 16a^4c^8 + b^4 \\
& c^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^{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^8 \\
& c^7 + 36b^9c^6 - 24b^{10}c^5 + 8b^{11}c^4 + 84ab^2c^{12} - 178ab^3c^{11} \\
& + 295ab^4c^{10} - 416ab^5c^9 + 375ab^6c^8 - 308ab^7c^7 + 244a \\
& b^8c^6 - 72ab^9c^5 - 8ab^{10}c^4 + 184a^2b^3c^{12} - 328a^3b^3c^{11} - \\
& 16a^4b^3c^{10} + 496a^5b^3c^9 - 88a^6b^3c^8 - 416a^2b^2c^{11} + 770a^2b^3 \\
& c^{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 + 8 \\
& a^3b^8c^4 + 234a^4b^2c^9 - 1152a^4b^3c^8 + 416a^4b^4c^7 - 140a^4 \\
& b^5c^6 - 72a^4b^6c^5 + 64a^5b^2c^8 + 192a^5b^3c^7 + 220a^5b^4 \\
& c^6 - 256a^6b^2c^7 - 24ab^3c^{13})) / 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^4 \\
& b^4c^2 + 38a^5b^2c^3 - 12ab^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} + 6ab^5c^3(-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} \\
& ) * ((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 - 12ab^8 \\
& c + 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} + 6ab^5c^3(-4ac - b^2)^3)^{1/2} / (2(16a^2c^{10} + 32a^3 \\
& c^9 + 16a^4c^8 + b^4c^8 - b^6c^6 - 8ab^2c^9 + 10ab^4c^7 - 32a^2 \\
& b^2c^8 + a^2b^4c^6 - 8a^3b^2c^7)))^{1/2} - (2048 \tan(x/2) (20ab^{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 - 8ab^6c^6 + 4ab^7c^5 - \\
& 31ab^8c^4 + 20ab^9c^3 - 20ab^{10}c^2 - 160a^2b^{10}c + 320a^3b^9 \\
& c + 26a^4b^8c - 300a^4b^8c - 84a^5b^7c + 136a^5b^7c + 2a^6b^6 \\
& c^6 - 24a^6b^6c + 168a^7b^6c^5 - 92a^8b^6c^4 + 20a^2b^4c^7 + 8a^2 \\
& b^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^3 \\
& c^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 - 300 \\
& a^6b^5c^2 + 384a^7b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8 \\
& b^2c^3 + 24ab^{11}c)) / c^8) * ((b^{10} - a^2b^8 - 8a^5c^5 - 8a^6c^4 - b^7
\end{aligned}$$

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

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

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

$$\begin{aligned}
& 3 + 184*a*b^4*c^12 - 56*a*b^5*c^11 - 8*a*b^6*c^10 + 288*a^2*b*c^14 + 352*a^3*b*c^13 - 32*a^4*b*c^12 - 320*a^2*b^2*c^13 + 8*a^2*b^3*c^12 + 96*a^2*b^4*c^11 - 8*a^2*b^5*c^10 - 272*a^3*b^2*c^12 + 40*a^3*b^3*c^11 + 8*a^3*b^4*c^10 - 56*a^4*b^2*c^11 - 96*a*b*c^15)/c^8)*((b^10 - a^2*b^8 - 8*a^5*c^5 - 8*a^6*c^4 - b^7*(-(4*a*c - b^2)^3)^(1/2) + 10*a^3*b^6*c + a^2*b^5*(-(4*a*c - b^2)^3)^(1/2) + 52*a^2*b^6*c^2 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 - 33*a^4*b^4*c^2 + 38*a^5*b^2*c^3 - 12*a*b^8*c + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 4*a^3*b^3*c*(-(4*a*c - b^2)^3)^(1/2) + 3*a^4*b*c^2*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^10 + 32*a^3*c^9 + 16*a^4*c^8 + b^4*c^8 - b^6*c^6 - 8*a*b^2*c^9 + 10*a*b^4*c^7 - 32*a^2*b^2*c^8 + a^2*b^4*c^6 - 8*a^3*b^2*c^7)))^(1/2) - (2048*tan(x/2)*(8*a*c^14 - 64*a^2*c^13 + 80*a^3*c^12 + 168*a^4*c^11 - 192*a^5*c^10 - 136*a^6*c^9 + 72*a^7*c^8 - 2*b^2*c^13 + 6*b^3*c^12 - 17*b^4*c^11 + 33*b^5*c^10 - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^10*c^5 + 8*b^11*c^4 + 84*a*b^2*c^12 - 178*a*b^3*c^11 + 295*a*b^4*c^10 - 416*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a*b^10*c^4 + 184*a^2*b*c^12 - 328*a^3*b*c^11 - 16*a^4*b*c^10 + 496*a^5*b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c^11 + 770*a^2*b^3*c^10 - 723*a^2*b^4*c^9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2*b^9*c^4 + 180*a^3*b^2*c^10 - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 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
\end{aligned}$$

$$\begin{aligned}
&^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^7 \\
&*b^2c^4 + 272a^7b^3c^3 + 44a^7b^4c^2 - 32a^8b^2c^3 + 24a^8b^3c^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 - 96 \\
&*a^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^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^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 * (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^2c^{10} + 112a^3b^3c^9 + 100a^3b^4c^8 - 200a^3b^5c^7 - 96a^3b^6c^6 - 47a^3b^7c^5 + 145a^3b^8c^4 - 354a^3b^9c^3 + 612a^3b^{10}c^2 - 655a^3b^{11}c + 635a^3b^{12} - 202a^4b^2c^9 - 222a^4b^3c^8 + 4a^4b^4c^7 - 564a^4b^5c^6 - 115a^4b^6c^5 + 856a^4b^7c^4 + 2a^4b^8c^3 - 20a^4b^9c^2 - 37a^4b^{10}c + 9a^4b^{11} - 583a^4b^{12} - 1362a^5b^2c^8 + 99a^5b^3c^7 + 904a^5b^4c^6 + 394a^5b^5c^5 - 388a^5b^6c^4 - 60a^5b^7c^3 - 340a^5b^8c^2 + 364a^5b^9c - 524a^5b^{10} + 536a^5b^{11} - 238a^5b^{12} + 251a^6b^2c^9 - 524a^6b^3c^8 + 536a^6b^4c^7 - 564a^6b^5c^6 - 115a^6b^6c^5 + 856a^6b^7c^4 + 2a^6b^8c^3 - 20a^6b^9c^2 - 37a^6b^{10}c + 9a^6b^{11} - 583a^6b^{12} - 1362a^7b^2c^9 + 99a^7b^3c^8 + 904a^7b^4c^7 + 394a^7b^5c^6 - 388a^7b^6c^5 - 60a^7b^7c^4 - 340a^7b^8c^3 + 364a^7b^9c^2 - 524a^7b^{10} + 536a^7b^{11} - 238a^7b^{12} + 251a^8b^2c^{10} - 524a^8b^3c^9 + 536a^8b^4c^8 - 564a^8b^5c^7 - 115a^8b^6c^6 + 856a^8b^7c^5 + 2a^8b^8c^4 - 20a^8b^9c^3 - 37a^8b^{10}c^2 + 9a^8b^{11}c - 583a^8b^{12} - 1362a^9b^2c^{10} + 99a^9b^3c^9 + 904a^9b^4c^8 + 394a^9b^5c^7 - 388a^9b^6c^6 - 60a^9b^7c^5 - 340a^9b^8c^4 + 364a^9b^9c^3 - 524a^9b^{10}c^2 + 536a^9b^{11}c - 238a^9b^{12} + 251a^{10}b^2c^{11} - 524a^{10}b^3c^{10} + 536a^{10}b^4c^9 - 564a^{10}b^5c^8 - 115a^{10}b^6c^7 + 856a^{10}b^7c^6 + 2a^{10}b^8c^5 - 20a^{10}b^9c^4 - 37a^{10}b^{10}c^3 + 9a^{10}b^{11}c^2 - 583a^{10}b^{12}c - 1362a^{11}b^2c^{11} + 99a^{11}b^3c^{10} + 904a^{11}b^4c^9 + 394a^{11}b^5c^8 - 388a^{11}b^6c^7 - 60a^{11}b^7c^6 - 340a^{11}b^8c^5 + 364a^{11}b^9c^4 - 524a^{11}b^{10}c^3 + 536a^{11}b^{11}c^2 - 238a^{11}b^{12}c + 251a^{12}b^2c^{12} - 524a^{12}b^3c^{11} + 536a^{12}b^4c^{10} - 564a^{12}b^5c^9 - 115a^{12}b^6c^8 + 856a^{12}b^7c^7 + 2a^{12}b^8c^6 - 20a^{12}b^9c^5 - 37a^{12}b^{10}c^4 + 9a^{12}b^{11}c^3 - 583a^{12}b^{12}c^2 - 1362a^{13}b^2c^{12} + 99a^{13}b^3c^{11} + 904a^{13}b^4c^{10} + 394a^{13}b^5c^9 - 388a^{13}b^6c^8 - 60a^{13}b^7c^7 - 340a^{13}b^8c^6 + 364a^{13}b^9c^5 - 524a^{13}b^{10}c^4 + 536a^{13}b^{11}c^3 - 238a^{13}b^{12}c^2 + 251a^{14}b^2c^{13} - 524a^{14}b^3c^{12} + 536a^{14}b^4c^{11} - 564a^{14}b^5c^{10} - 115a^{14}b^6c^9 + 856a^{14}b^7c^8 + 2a^{14}b^8c^7 - 20a^{14}b^9c^6 - 37a^{14}b^{10}c^5 + 9a^{14}b^{11}c^4 - 583a^{14}b^{12}c^3 - 1362a^{15}b^2c^{13} + 99a^{15}b^3c^{12} + 904a^{15}b^4c^{11} + 394a^{15}b^5c^{10} - 388a^{15}b^6c^9 - 60a^{15}b^7c^8 - 340a^{15}b^8c^7 + 364a^{15}b^9c^6 - 524a^{15}b^{10}c^5 + 536a^{15}b^{11}c^4 - 238a^{15}b^{12}c^3 + 251a^{16}b^2c^{14} - 524a^{16}b^3c^{13} + 536a^{16}b^4c^{12} - 564a^{16}b^5c^{11} - 115a^{16}b^6c^{10} + 856a^{16}b^7c^9 + 2a^{16}b^8c^8 - 20a^{16}b^9c^7 - 37a^{16}b^{10}c^6 + 9a^{16}b^{11}c^5 - 583a^{16}b^{12}c^4 - 1362a^{17}b^2c^{14} + 99a^{17}b^3c^{13} + 904a^{17}b^4c^{12} + 394a^{17}b^5c^{11} - 388a^{17}b^6c^{10} - 60a^{17}b^7c^9 - 340a^{17}b^8c^8 + 364a^{17}b^9c^7 - 524a^{17}b^{10}c^6 + 536a^{17}b^{11}c^5 - 238a^{17}b^{12}c^4 + 251a^{18}b^2c^{15} - 524a^{18}b^3c^{14} + 536a^{18}b^4c^{13} - 564a^{18}b^5c^{12} - 115a^{18}b^6c^{11} + 856a^{18}b^7c^{10} + 2a^{18}b^8c^9 - 20a^{18}b^9c^8 - 37a^{18}b^{10}c^7 + 9a^{18}b^{11}c^6 - 583a^{18}b^{12}c^5 - 1362a^{19}b^2c^{15} + 99a^{19}b^3c^{14} + 904a^{19}b^4c^{13} + 394a^{19}b^5c^{12} - 388a^{19}b^6c^{11} - 60a^{19}b^7c^{10} - 340a^{19}b^8c^9 + 364a^{19}b^9c^8 - 524a^{19}b^{10}c^7 + 536a^{19}b^{11}c^6 - 238a^{19}b^{12}c^5 + 251a^{20}b^2c^{16} - 524a^{20}b^3c^{15} + 536a^{20}b^4c^{14} - 564a^{20}b^5c^{13} - 115a^{20}b^6c^{12} + 856a^{20}b^7c^{11} + 2a^{20}b^8c^{10} - 20a^{20}b^9c^9 - 37a^{20}b^{10}c^8 + 9a^{20}b^{11}c^7 - 583a^{20}b^{12}c^6 - 1362a^{21}b^2c^{16} + 99a^{21}b^3c^{15} + 904a^{21}b^4c^{14} + 394a^{21}b^5c^{13} - 388a^{21}b^6c^{12} - 60a^{21}b^7c^{11} - 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524a^{26}b^3c^{18} + 536a^{26}b^4c^{17} - 564a^{26}b^5c^{16} - 115a^{26}b^6c^{15} + 856a^{26}b^7c^{14} + 2a^{26}b^8c^{13} - 20a^{26}b^9c^{12} - 37a^{26}b^{10}c^{11} + 9a^{26}b^{11}c^{10} - 583a^{26}b^{12}c^9 - 1362a^{27}b^2c^{19} + 99a^{27}b^3c^{18} + 904a^{27}b^4c^{17} + 394a^{27}b^5c^{16} - 388a^{27}b^6c^{15} - 60a^{27}b^7c^{14} - 340a^{27}b^8c^{13} + 364a^{27}b^9c^{12} - 524a^{27}b^{10}c^{11} + 536a^{27}b^{11}c^{10} - 238a^{27}b^{12}c^9 + 251a^{28}b^2c^{20} - 524a^{28}b^3c^{19} + 536a^{28}b^4c^{18} - 564a^{28}b^5c^{17} - 115a^{28}b^6c^{16} + 856a^{28}b^7c^{15} + 2a^{28}b^8c^{14} - 20a^{28}b^9c^{13} - 37a^{28}b^{10}c^{12} + 9a^{28}b^{11}c^{11} - 583a^{28}b^{12}c^{10} - 1362a^{29}b^2c^{20} + 99a^{29}b^3c^{19} + 904a^{29}b^4c^{18} + 394a^{29}b^5c^{17} - 388a^{29}b^6c^{16} - 60a^{29}b^7c^{15} - 340a^{29}b^8c^{14} + 364a^{29}b^9c^{13} - 524a^{29}b^{10}c^{12} + 536a^{29}b^{11}c^{11} - 238a^{29}b^{12}c^{10} + 251a^{30}b^2c^{21} - 524a^{30}b^3c^{20} + 536a^{30}b^4c^{19} - 564a^{30}b^5c^{18} - 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20a^{34}b^9c^{16} - 37a^{34}b^{10}c^{15} + 9a^{34}b^{11}c^{14} - 583a^{34}b^{12}c^{13} - 1362a^{35}b^2c^{23} + 99a^{35}b^3c^{22} + 904a^{35}b^4c^{21} + 394a^{35}b^5c^{20} - 388a^{35}b^6c^{19} - 60a^{35}b^7c^{18} - 340a^{35}b^8c^{17} + 364a^{35}b^9c^{16} - 524a^{35}b^{10}c^{15} + 536a^{35}b^{11}c^{14} - 238a^{35}b^{12}c^{13} + 251a^{36}b^2c^{24} - 524a^{36}b^3c^{23} + 536a^{36}b^4c^{22} - 564a^{36}b^5c^{21} - 115a^{36}b^6c^{20} + 856a^{36}b^7c^{19} + 2a^{36}b^8c^{18} - 20a^{36}b^9c^{17} - 37a^{36}b^{10}c^{16} + 9a^{36}b^{11}c^{15} - 583a^{36}b^{12}c^{14} - 1362a^{37}b^2c^{24} + 99a^{37}b^3c^{23} + 904a^{37}b^4c^{22} + 394a^{37}b^5c^{21} - 388a^{37}b^6c^{20} - 60a^{37}b^7c^{19} - 340a^{37}b^8c^{18} + 364a^{37}b^9c^{17} - 524a^{37}b^{10}c^{16} + 536a^{37}b^{11}c^{15} - 238a^{37}b^{12}c^{14} + 251a^{38}b^2c^{25} - 524a^{38}b^3c^{24} + 536a^{38}b^4c^{23} - 564a^{38}b^5c^{22} - 115a^{38}b^6c^{21} + 856a^{38}b^7c^{20} + 2a^{38}b^8c^{19} - 20a^{38}b^9c^{18} - 37a^{38}b^{10}c^{17} + 9a^{38}b^{11}c^{16} - 583a^{38}b^{12}c^{15} - 1362a^{39}b^2c^{25} + 99a^{39}b^3c^{24} + 904a^{39}b^4c^{23} + 394a^{39}b^5c^{22} - 388a^{39}b^6c^{21} - 60a^{39}b^7c^{20} - 340a^{39}b^8c^{19} + 364a^{39}b^9c^{18} - 524a^{39}b^{10}c^{17} + 536a^{39}b^{11}c^{16} - 238a^{39}b^{12}c^{15} + 251a^{40}b^2c^{26} - 524a^{40}b^3c^{25} + 536a^{40}b^4c^{24} - 564a^{40}b^5c^{23} - 115a^{40}b^6c^{22} + 856a^{40}b^7c^{21} + 2a^{40}b^8c^{20} - 20a^{40}b^9c^{19} - 37a^{40}b^{10}c^{18} + 9a^{40}b^{11}c^{17} - 583a^{40}b^{12}c^{16} - 1362a^{41}b^2c^{26} + 99a^{41}b^3c^{25} + 904a^{41}b^4c^{24} + 394a^{41}b^5c^{23} - 388a^{41}b^6c^{22} - 60a^{41}b^7c^{21} - 340a^{41}b^8c^{20} + 364a^{41}b^9c^{19} - 524a^{41}b^{10}c^{18} + 536a^{41}b^{11}c^{17} - 238a^{41}b^{12}c^{16} + 251a^{42}b^2c^{27} - 524a^{42}b^3c^{26} + 536a^{42}b^4c^{25} - 564a^{42}b^5c^{24} - 115a^{42}b^6c^{23} + 856a^{42}b^7c^{22} + 2a^{42}b^8c^{21} - 20a^{42}b^9c^{20} - 37a^{42}b^{10}c^{19} + 9a^{42}b^{11}c^{18} - 583a^{42}b^{12}c^{17} - 1362a^{43}b^2c^{27} + 99a^{43}b^3c^{26} + 904a^{43}b^4c^{25} + 394a^{43}b^5c^{24} - 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524a^{47}b^{10}c^{21} + 536a^{47}b^{11}c^{20} - 238a^{47}b^{12}c^{19} + 251a^{48}b^2c^{30} - 524a^{48}b^3c^{29} + 536a^{48}b^4c^{28} - 564a^{48}b^5c^{27} - 115a^{48}b^6c^{26} + 856a^{48}b^7c^{25} + 2a^{48}b^8c^{24} - 20a^{48}b^9c^{23} - 37a^{48}b^{10}c^{22} + 9a^{48}b^{11}c^{21} - 583a^{48}b^{12}c^{20} - 1362a^{49}b^2c^{30} + 99a^{49}b^3c^{29} + 904a^{49}b^4c^{28} + 394a^{49}b^5c^{27} - 388a^{49}b^6c^{26} - 60a^{49}b^7c^{25} - 340a^{49}b^8c^{24} + 364a^{49}b^9c^{23} - 524a^{49}b^{10}c^{22} + 536a^{49}b^{11}c^{21} - 238a^{49}b^{12}c^{20} + 251a^{50}b^2c^{31} - 524a^{50}b^3c^{30} + 536a^{50}b^4c^{29} - 564a^{50}b^5c^{28} - 115a^{50}b^6c^{27} + 856a^{50}b^7c^{26} + 2a^{50}b^8c^{25} - 20a^{50}b^9c^{24} - 37a^{50}b^{10}c^{23} + 9a^{50}b^{11}c^{22} - 583a^{50}b^{12}c^{21} - 1362a^{51}b^2c^{31} + 99a^{51}b^3c^{30} + 904a^{51}b^4c^{29} + 394a^{51}b^5c^{28} - 388a^{51}b^6c^{27} - 60a^{51}b^7c^{26} - 340a^{51}b^8c^{25} + 364a^{51}b^9c^{24} - 524a^{51}b^{10}c^{23} + 536a^{51}b^{11}c^{22} - 238a^{51}b^{12}c^{21} + 251a^{52}b^2c^{32} - 524a^{52}b^3c^{31} + 536a^{52}b^4c^{30} - 564a^{52}b^5c^{29} - 115a^{52}b^6c^{28} + 856a^{52}b^7c^{27} + 2a^{52}b^8c^{26} - 20a^{52}b^9c^{25} - 37a^{52}b^{10}c^{24} + 9a^{52}b^{11}c^{23} - 583a^{52}b^{12}c^{22} - 1362a^{53}b^2c^{32} + 99a^{53}b^3c^{31} + 904a^{53}b^4c^{30} + 394a^{53}b^5c^{29} - 388a^{53}b^6c^{28} - 60a^{53}b^7c^{27} - 340a^{53}b^8c^{26} + 364a^{53}b^9c^{25} - 524a^{53}b^{10}c^{24} + 536a^{53}b^{11}c^{23} - 238a^{53}b^{12}c^{22} + 251a^{54}b^2c^{33} - 524a^{54}b^3c^{32} + 536a^{54}b^4c^{31} - 564a^{54}b^5c^{30} - 115a^{54}b^6c^{29} + 856a^{54}b^7c^{28} + 2a^{54}b^8c^{27} - 20a^{54}b^9c^{26} - 37a^{54}b^{10}c^{25} + 9a^{54}b^{11}c^{24} - 583a^{54}b^{12}c^{23} - 1362a^{55}b^2c^{33} + 99a^{55}b^3c^{32} + 904a^{55}b^4c^{31} + 394a^{55}b^5c^{30} - 388a^{55}b^6c^{29} - 60a^{55}b^7c^{28} - 340a^{55}b^8c^{27} + 364a^{55}b^9c^{26} - 524a^{55}b^{10}c^{25} + 536a^{55}b^{11}c^{24} - 238a^{55}b^{12}c^{23} + 251a^{56}b^2c^{34} - 524a^{56}b^3c^{33} + 536a^{56}b^4c^{32} - 564a^{56}b^5c^{31} - 115a^{56}b^6c^{30} + 856a^{56}b^7c^{29} + 2a^{56}b^8c^{28} - 20a^{56}b^9c^{27} - 37a^{56}b^{10}c^{26} + 9a^{56}b^{11}c^{25} - 583a^{56}b^{12}c^{24} - 1362a^{57}b^2c^{34} + 99a^{57}b^3c^{33} + 904a^{57}b^4c^{32} + 394a^{57}b^5c^{31} - 388a^{57}b^6c^{30} - 60a^{57}b^7c^{29} - 340a^{57}b^8c^{28} + 364a^{57}b^9c^{27} - 524a^{57}b^{10}c^{26} + 536a^{57}b^{11}c^{25} - 238a^{57}b^{12}c^{24} + 251a^{58}b^2c^{35} - 524a^{58}b^3c^{34} + 536a^{58}b^4c^{33} - 564a^{58}b^5c^{32} - 115a^{58}b^6c^{31} + 856a^{58}b^7c^{30} + 2a^{58}b^8c^{29} - 20a^{58}b^9c^{28} - 37a^{58}b^{10}c^{27} + 9a^{58}b^{11}c^{26} - 583a^{58}b^{12}c^{25} - 1362a^{59}b^2c^{35} + 99a^{59}b^3c^{34} + 904a^{59}b^4c^{33} + 394a^{59}b^5c^{32} - 388a^{59}b^6c^{31} - 60a^{59}b^7c^{30} - 340a^{59}b^8c^{29} + 364a^{59}b^9c^{28} - 524a^{59}b^{10}c^{27} + 536a^{59}b^{11}c^{26} - 238a^{59}b^{12}c^{25} + 251a^{60}b^2c^{36} - 524a^{60}b^3c^{35} + 536a^{60}b^4c^{34} - 564a^{60}b^5c^{33} - 115a^{60}b^6c^{32} + 856a^{60}b^7c^{31} + 2a^{60}b^8c^{30} - 20a^{60}b^9c^{29} - 37a^{60}b^{10}c^{28} + 9a^{60}b^{11}c^{27} - 583a^{60}b^{12}c^{26} - 1362a^{61}b^2c^{36} + 99a^{61}b^3c^{35} + 904a^{61}b^4c^{34} + 394a^{61}b^5c^{33} -$$

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



$$\begin{aligned}
&^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 + 24ab^{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 - 12ab^8c + 4a^3b^6c^3 * (-4ac - b^2)^3)^{1/2} - 4a^3b^3c * (-4ac - b^2)^3)^{1/2} + 3a^4b^5c^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} * ((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 - 12ab^8c + 4a^3b^6c^3 * (-4ac - b^2)^3)^{1/2} - 4a^3b^3c * (-4ac - b^2)^3)^{1/2} + 3a^4b^5c^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} * 2i + (\operatorname{atan}(-((2048 * \tan(x/2) * (20ab^{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 - 8ab^6c^6 + 4ab^7c^5 - 31ab^8c^4 + 20ab^9c^3 - 20ab^{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 + 24ab^{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 - 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^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 - 222a^3b^4c^7 + 112a^3b^5c^6 - 22a^3b^6c^5 + 22a^3b^7c^4 - 2a^3b^8c^3 - 2a^3b^9c^2 + 2a^3b^{10}c - 2a^3b^{11}c^2 + 2a^3b^{12}c^3 - 2a^4b^2c^9 - 2a^4b^3c^8 - 2a^4b^4c^7 - 2a^4b^5c^6 - 2a^4b^6c^5 - 2a^4b^7c^4 - 2a^4b^8c^3 - 2a^4b^9c^2 - 2a^4b^{10}c + 2a^4b^{11}c^2 - 2a^4b^{12}c^3 - 2a^5b^2c^8 - 2a^5b^3c^7 - 2a^5b^4c^6 - 2a^5b^5c^5 - 2a^5b^6c^4 - 2a^5b^7c^3 - 2a^5b^8c^2 - 2a^5b^9c + 2a^5b^{10}c^2 - 2a^5b^{11}c^3 - 2a^5b^{12}c^4 - 2a^6b^2c^7 - 2a^6b^3c^6 - 2a^6b^4c^5 - 2a^6b^5c^4 - 2a^6b^6c^3 - 2a^6b^7c^2 - 2a^6b^8c + 2a^6b^9c^2 - 2a^6b^{10}c^3 - 2a^6b^{11}c^4 - 2a^6b^{12}c^5 - 2a^7b^2c^6 - 2a^7b^3c^5 - 2a^7b^4c^4 - 2a^7b^5c^3 - 2a^7b^6c^2 - 2a^7b^7c + 2a^7b^8c^2 - 2a^7b^9c^3 - 2a^7b^{10}c^4 - 2a^7b^{11}c^5 - 2a^7b^{12}c^6 - 2a^8b^2c^5 - 2a^8b^3c^4 - 2a^8b^4c^3 - 2a^8b^5c^2 - 2a^8b^6c + 2a^8b^7c^2 - 2a^8b^8c^3 - 2a^8b^9c^4 - 2a^8b^{10}c^5 - 2a^8b^{11}c^6 - 2a^8b^{12}c^7 - 2a^9b^2c^4 - 2a^9b^3c^3 - 2a^9b^4c^2 - 2a^9b^5c + 2a^9b^6c^2 - 2a^9b^7c^3 - 2a^9b^8c^4 - 2a^9b^9c^5 - 2a^9b^{10}c^6 - 2a^9b^{11}c^7 - 2a^9b^{12}c^8 - 2a^{10}b^2c^3 - 2a^{10}b^3c^2 - 2a^{10}b^4c + 2a^{10}b^5c^2 - 2a^{10}b^6c^3 - 2a^{10}b^7c^4 - 2a^{10}b^8c^5 - 2a^{10}b^9c^6 - 2a^{10}b^{10}c^7 - 2a^{10}b^{11}c^8 - 2a^{10}b^{12}c^9 - 2a^{11}b^2c^2 - 2a^{11}b^3c + 2a^{11}b^4c^2 - 2a^{11}b^5c^3 - 2a^{11}b^6c^4 - 2a^{11}b^7c^5 - 2a^{11}b^8c^6 - 2a^{11}b^9c^7 - 2a^{11}b^{10}c^8 - 2a^{11}b^{11}c^9 - 2a^{11}b^{12}c^{10} - 2a^{12}b^2c^1 - 2a^{12}b^3c^2 - 2a^{12}b^4c^3 - 2a^{12}b^5c^4 - 2a^{12}b^6c^5 - 2a^{12}b^7c^6 - 2a^{12}b^8c^7 - 2a^{12}b^9c^8 - 2a^{12}b^{10}c^9 - 2a^{12}b^{11}c^{10} - 2a^{12}b^{12}c^{11})))^{1/2}
\end{aligned}$$

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

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

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

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

$$\begin{aligned}
& 33*b^5*c^{10} - 49*b^6*c^9 + 61*b^7*c^8 - 52*b^8*c^7 + 36*b^9*c^6 - 24*b^{10}*c^5 + 8*b^{11}*c^4 + 84*a*b^2*c^{12} - 178*a*b^3*c^{11} + 295*a*b^4*c^{10} - 416*a*b^5*c^9 + 375*a*b^6*c^8 - 308*a*b^7*c^7 + 244*a*b^8*c^6 - 72*a*b^9*c^5 - 8*a*b^{10}*c^4 + 184*a^2*b*c^{12} - 328*a^3*b*c^{11} - 16*a^4*b*c^{10} + 496*a^5*b*c^9 - 88*a^6*b*c^8 - 416*a^2*b^2*c^{11} + 770*a^2*b^3*c^{10} - 723*a^2*b^4*c^9 + 779*a^2*b^5*c^8 - 732*a^2*b^6*c^7 + 80*a^2*b^7*c^6 + 112*a^2*b^8*c^5 - 8*a^2*b^9*c^4 + 180*a^3*b^2*c^{10} - 494*a^3*b^3*c^9 + 521*a^3*b^4*c^8 + 572*a^3*b^5*c^7 - 424*a^3*b^6*c^6 + 56*a^3*b^7*c^5 + 8*a^3*b^8*c^4 + 234*a^4*b^2*c^9 - 1152*a^4*b^3*c^8 + 416*a^4*b^4*c^7 - 140*a^4*b^5*c^6 - 72*a^4*b^6*c^5 + 64*a^5*b^2*c^8 + 192*a^5*b^3*c^7 + 220*a^5*b^4*c^6 - 256*a^6*b^2*c^7 - 24*a*b*c^{13})/c^8 + (((2048*(16*a^3*c^{13} - 32*a^2*c^{14} + 176*a^4*c^{12} + 176*a^5*c^{11} + 48*a^6*c^{10} - 2*b^4*c^{12} + 6*b^5*c^{11} - 18*b^6*c^{10} + 26*b^7*c^9 - 12*b^8*c^8 + 16*a*b^2*c^{13} - 40*a*b^3*c^{12} + 122*a*b^4*c^{11} - 192*a*b^5*c^{10} + 74*a*b^6*c^9 + 20*a*b^7*c^8 + 64*a^2*b*c^{13} - 144*a^3*b*c^{12} - 352*a^4*b*c^{11} - 144*a^5*b*c^{10} - 204*a^2*b^2*c^{12} + 388*a^2*b^3*c^{11} - 50*a^2*b^4*c^{10} - 182*a^2*b^5*c^9 + 4*a^2*b^6*c^8 - 260*a^3*b^2*c^{11} + 496*a^3*b^3*c^{10} + 10*a^3*b^4*c^9 - 20*a^3*b^5*c^8 - 148*a^4*b^2*c^{10} + 116*a^4*b^3*c^9 + 8*a^4*b^4*c^8 - 44*a^5*b^2*c^9))/c^8 + (1024*tan(x/2)*(b^2*2i - a*c*2i + c^2*1i)*(32*a*c^{16} - 64*a^2*c^{15} - 128*a^3*c^{14} + 64*a^4*c^{13} + 96*a^5*c^{12} - 8*b^2*c^{15} + 24*b^3*c^{14} - 32*b^4*c^{13} + 32*b^5*c^{12} - 24*b^6*c^{11} + 8*b^7*c^{10} + 144*a*b^2*c^{14} - 200*a*b^3*c^{13} + 184*a*b^4*c^{12} - 56*a*b^5*c^{11} - 8*a*b^6*c^{10} + 288*a^2*b*c^{14} + 352*a^3*b*c^{13} - 32*a^4*b*c^{12} - 320*a^2*b^2*c^{13} + 8*a^2*b^3*c^{12} + 96*a^2*b^4*c^{11} - 8*a^2*b^5*c^{10} - 272*a^3*b^2*c^{12} + 40*a^3*b^3*c^{11} + 8*a^3*b^4*c^{10} - 56*a^4*b^2*c^{11} - 96*a*b*c^{15}))/c^{11}*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i))/(2*c^3))*(b^2*2i - a*c*2i + c^2*1i)*1i)/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]  $-b*x/c^2 + \sin(x)/c + 2*\arctan((b-2*c - (-4*a*c+b^2)^{(1/2)})^{(1/2)}*\tan(1/2*x)/(b+2*c - (-4*a*c+b^2)^{(1/2)})^{(1/2)})*(b^2-a*c-b^3/(-4*a*c+b^2)^{(1/2)}+3*a*b*c/(-4*a*c+b^2)^{(1/2)})/c^2/(b-2*c - (-4*a*c+b^2)^{(1/2)})^{(1/2)}/(b+2*c - (-4*a*c+b^2)^{(1/2)})^{(1/2)} + 2*\arctan((b-2*c + (-4*a*c+b^2)^{(1/2)})^{(1/2)}*\tan(1/2*x)/(b+2*c + (-4*a*c+b^2)^{(1/2)})^{(1/2)})*(b^2-a*c+b^3/(-4*a*c+b^2)^{(1/2)}-3*a*b*c/(-4*a*c+b^2)^{(1/2)})/c^2/(b-2*c + (-4*a*c+b^2)^{(1/2)})^{(1/2)}/(b+2*c + (-4*a*c+b^2)^{(1/2)})^{(1/2)}$

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

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

Antiderivative was successfully verified.

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

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

**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



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

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

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

Antiderivative was successfully verified.

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

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

**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.



$$\begin{aligned}
& 4)c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*\cos(x) - 2*(a^5*b^3 - a^3*b^5)*c - 1/2*\sqrt{2}*((12*a^2*b*c^9 + 7*(4*a^3*b - a*b^3)*c^8 + (20*a^4*b - 27*a^2*b^3 + b^5)*c^7 + (4*a^5*b - 13*a^3*b^3 + 9*a*b^5)*c^6 - (a^4*b^3 - 2*a^2*b^5 + b^7)*c^5)*\sqrt{-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*\sin(x) - (12*a^4*b*c^5 + (20*a^5*b - 31*a^3*b^3)*c^4 + (8*a^6*b - 33*a^4*b^3 + 27*a^2*b^5)*c^3 - 3*(2*a^5*b^3 - 5*a^3*b^5 + 3*a*b^7)*c^2 + (a^4*b^5 - 2*a^2*b^7 + b^9)*c)*\sin(x))*\sqrt{(a^2*b^4 - b^6 + 2*a^3*c^3 + (2*a^4 - 9*a^2*b^2)*c^2 - 2*(2*a^3*b^2 - 3*a*b^4)*c + (4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4))*\sqrt{-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8)))/(4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4)) - (a^5*b^4 - a^3*b^6 - 3*a^5*b^2*c^2 - 2*(a^6*b^2 - 2*a^4*b^4)*c)*\cos(x)) + \sqrt{2}*c^2*\sqrt{(a^2*b^4 - b^6 + 2*a^3*c^3 + (2*a^4 - 9*a^2*b^2)*c^2 - 2*(2*a^3*b^2 - 3*a*b^4)*c - (4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4))*\sqrt{-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8)))/(4*a*c^7 + (8*a^2 - b^2)*c^6 + 2*(2*a^3 - 3*a*b^2)*c^5 - (a^2*b^2 - b^4)*c^4))*\log(-6*a^5*b*c^3 - 4*(a^6*b - 2*a^4*b^3)*c^2 - (4*a^4*c^7 + (8*a^5 - a^3*b^2)*c^6 + 2*(2*a^6 - 3*a^4*b^2)*c^5 - (a^5*b^2 - a^3*b^4)*c^4)*\sqrt{-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*\cos(x) + 2*(a^5*b^3 - a^3*b^5)*c + 1/2*\sqrt{2}*((12*a^2*b*c^9 + 7*(4*a^3*b - a*b^3)*c^8 + (20*a^4*b - 27*a^2*b^3 + b^5)*c^7 + (4*a^5*b - 13*a^3*b^3 + 9*a*b^5)*c^6 - (a^4*b^3 - 2*a^2*b^5 + b^7)*c^5)*\sqrt{-(a^4*b^6 - 2*a^2*b^8 + b^10 + 9*a^4*b^2*c^4 + 12*(a^5*b^2 - 2*a^3*b^4)*c^3 + 2*(2*a^6*b^2 - 11*a^4*b^4 + 11*a^2*b^6)*c^2 - 4*(a^5*b^4 - 3*a^3*b^6 + 2*a*b^8)*c)/(4*a*c^13 + (16*a^2 - b^2)*c^12 + 12*(2*a^3 - a*b^2)*c^11 + 2*(8*a^4 - 11*a^2*b^2 + b^4)*c^10 + 4*(a^5 - 3*a^3*b^2 + 2*a*b^4)*c^9 - (a^4*b^2 - 2*a^2*b^4 + b^6)*c^8))*\sin(x) + (12*a^4*b*c^5 + (20*a^5*b - 31*a^3*b^3)*c^4 + (8*a^6*b - 33*a^4*b^3 + 27*a^2*b^5)*c^3 - 3*(2*a^5*b^3 - 5*a^3*b^5 + 3*a*b^7)*c^2 + (a^4*b^5 - 2*a^2*b^7 + b^9)*c)
\end{aligned}$$

```

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

```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

**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 + 31a^2b^3c^8 - 46ab^4c^7 + 15a^2b^5c^6 + 5a^2b^6c^5 - 44a^2b^7c^4 - 64a^3b^2c^8 - 28a^4b^3c^7 - 8a^5b^4c^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) * ((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^2 * (-4ac - b^2)^3)^{1/2} - 4ab^3c * (-4ac - b^2)^3)^{1/2} + 2a^3b^2c * (-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^2 * (-4ac - b^2)^3)^{1/2} - 4ab^3c * (-4ac - b^2)^3)^{1/2} + 2a^3b^2c * (-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 - 10a^3b^6c^2 + 10a^3b^7c^1 - 10a^3b^8c^0 - 10a^3b^9c^{-1} + 10a^3b^{10}c^{-2} - 10a^3b^{11}c^{-3} + 10a^3b^{12}c^{-4} - 10a^3b^{13}c^{-5} + 10a^3b^{14}c^{-6} - 10a^3b^{15}c^{-7} + 10a^3b^{16}c^{-8} - 10a^3b^{17}c^{-9} + 10a^3b^{18}c^{-10} - 10a^3b^{19}c^{-11} + 10a^3b^{20}c^{-12} - 10a^3b^{21}c^{-13} + 10a^3b^{22}c^{-14} - 10a^3b^{23}c^{-15} + 10a^3b^{24}c^{-16} - 10a^3b^{25}c^{-17} + 10a^3b^{26}c^{-18} - 10a^3b^{27}c^{-19} + 10a^3b^{28}c^{-20} - 10a^3b^{29}c^{-21} + 10a^3b^{30}c^{-22} - 10a^3b^{31}c^{-23} + 10a^3b^{32}c^{-24} - 10a^3b^{33}c^{-25} + 10a^3b^{34}c^{-26} - 10a^3b^{35}c^{-27} + 10a^3b^{36}c^{-28} - 10a^3b^{37}c^{-29} + 10a^3b^{38}c^{-30} - 10a^3b^{39}c^{-31} + 10a^3b^{40}c^{-32} - 10a^3b^{41}c^{-33} + 10a^3b^{42}c^{-34} - 10a^3b^{43}c^{-35} + 10a^3b^{44}c^{-36} - 10a^3b^{45}c^{-37} + 10a^3b^{46}c^{-38} - 10a^3b^{47}c^{-39} + 10a^3b^{48}c^{-40} - 10a^3b^{49}c^{-41} + 10a^3b^{50}c^{-42} - 10a^3b^{51}c^{-43} + 10a^3b^{52}c^{-44} - 10a^3b^{53}c^{-45} + 10a^3b^{54}c^{-46} - 10a^3b^{55}c^{-47} + 10a^3b^{56}c^{-48} - 10a^3b^{57}c^{-49} + 10a^3b^{58}c^{-50} - 10a^3b^{59}c^{-51} + 10a^3b^{60}c^{-52} - 10a^3b^{61}c^{-53} + 10a^3b^{62}c^{-54} - 10a^3b^{63}c^{-55} + 10a^3b^{64}c^{-56} - 10a^3b^{65}c^{-57} + 10a^3b^{66}c^{-58} - 10a^3b^{67}c^{-59} + 10a^3b^{68}c^{-60} - 10a^3b^{69}c^{-61} + 10a^3b^{70}c^{-62} - 10a^3b^{71}c^{-63} + 10a^3b^{72}c^{-64} - 10a^3b^{73}c^{-65} + 10a^3b^{74}c^{-66} - 10a^3b^{75}c^{-67} + 10a^3b^{76}c^{-68} - 10a^3b^{77}c^{-69} + 10a^3b^{78}c^{-70} - 10a^3b^{79}c^{-71} + 10a^3b^{80}c^{-72} - 10a^3b^{81}c^{-73} + 10a^3b^{82}c^{-74} - 10a^3b^{83}c^{-75} + 10a^3b^{84}c^{-76} - 10a^3b^{85}c^{-77} + 10a^3b^{86}c^{-78} - 10a^3b^{87}c^{-79} + 10a^3b^{88}c^{-80} - 10a^3b^{89}c^{-81} + 10a^3b^{90}c^{-82} - 10a^3b^{91}c^{-83} + 10a^3b^{92}c^{-84} - 10a^3b^{93}c^{-85} + 10a^3b^{94}c^{-86} - 10a^3b^{95}c^{-87} + 10a^3b^{96}c^{-88} - 10a^3b^{97}c^{-89} + 10a^3b^{98}c^{-90} - 10a^3b^{99}c^{-91} + 10a^3b^{100}c^{-92} - 10a^3b^{101}c^{-93} + 10a^3b^{102}c^{-94} - 10a^3b^{103}c^{-95} + 10a^3b^{104}c^{-96} - 10a^3b^{105}c^{-97} + 10a^3b^{106}c^{-98} - 10a^3b^{107}c^{-99} + 10a^3b^{108}c^{-100} - 10a^3b^{109}c^{-101} + 10a^3b^{110}c^{-102} - 10a^3b^{111}c^{-103} + 10a^3b^{112}c^{-104} - 10a^3b^{113}c^{-105} + 10a^3b^{114}c^{-106} - 10a^3b^{115}c^{-107} + 10a^3b^{116}c^{-108} - 10a^3b^{117}c^{-109} + 10a^3b^{118}c^{-110} - 10a^3b^{119}c^{-111} + 10a^3b^{120}c^{-112} - 10a^3b^{121}c^{-113} + 10a^3b^{122}c^{-114} - 10a^3b^{123}c^{-115} + 10a^3b^{124}c^{-116} - 10a^3b^{125}c^{-117} + 10a^3b^{126}c^{-118} - 10a^3b^{127}c^{-119} + 10a^3b^{128}c^{-120} - 10a^3b^{129}c^{-121} + 10a^3b^{130}c^{-122} - 10a^3b^{131}c^{-123} + 10a^3b^{132}c^{-124} - 10a^3b^{133}c^{-125} + 10a^3b^{134}c^{-126} - 10a^3b^{135}c^{-127} + 10a^3b^{136}c^{-128} - 10a^3b^{137}c^{-129} + 10a^3b^{138}c^{-130} - 10a^3b^{139}c^{-131} + 10a^3b^{140}c^{-132} - 10a^3b^{141}c^{-133} + 10a^3b^{142}c^{-134} - 10a^3b^{143}c^{-135} + 10a^3b^{144}c^{-136} - 10a^3b^{145}c^{-137} + 10a^3b^{146}c^{-138} - 10a^3b^{147}c^{-139} + 10a^3b^{148}c^{-140} - 10a^3b^{149}c^{-141} + 10a^3b^{150}c^{-142} - 10a^3b^{151}c^{-143} + 10a^3b^{152}c^{-144} - 10a^3b^{153}c^{-145} + 10a^3b^{154}c^{-146} - 10a^3b^{155}c^{-147} + 10a^3b^{156}c^{-148} - 10a^3b^{157}c^{-149} + 10a^3b^{158}c^{-150} - 10a^3b^{159}c^{-151} + 10a^3b^{160}c^{-152} - 10a^3b^{161}c^{-153} + 10a^3b^{162}c^{-154} - 10a^3b^{163}c^{-155} + 10a^3b^{164}c^{-156} - 10a^3b^{165}c^{-157} + 10a^3b^{166}c^{-158} - 10a^3b^{167}c^{-159} + 10a^3b^{168}c^{-160} - 10a^3b^{169}c^{-161} + 10a^3b^{170}c^{-162} - 10a^3b^{171}c^{-163} + 10a^3b^{172}c^{-164} - 10a^3b^{173}c^{-165} + 10a^3b^{174}c^{-166} - 10a^3b^{175}c^{-167} + 10a^3b^{176}c^{-168} - 10a^3b^{177}c^{-169} + 10a^3b^{178}c^{-170} - 10a^3b^{179}c^{-171} + 10a^3b^{180}c^{-172} - 10a^3b^{181}c^{-173} + 10a^3b^{182}c^{-174} - 10a^3b^{183}c^{-175} + 10a^3b^{184}c^{-176} - 10a^3b^{185}c^{-177} + 10a^3b^{186}c^{-178} - 10a^3b^{187}c^{-179} + 10a^3b^{188}c^{-180} - 10a^3b^{189}c^{-181} + 10a^3b^{190}c^{-182} - 10a^3b^{191}c^{-183} + 10a^3b^{192}c^{-184} - 10a^3b^{193}c^{-185} + 10a^3b^{194}c^{-186} - 10a^3b^{195}c^{-187} + 10a^3b^{196}c^{-188} - 10a^3b^{197}c^{-189} + 10a^3b^{198}c^{-190} - 10a^3b^{199}c^{-191} + 10a^3b^{200}c^{-192} - 10a^3b^{201}c^{-193} + 10a^3b^{202}c^{-194} - 10a^3b^{203}c^{-195} + 10a^3b^{204}c^{-196} - 10a^3b^{205}c^{-197} + 10a^3b^{206}c^{-198} - 10a^3b^{207}c^{-199} + 10a^3b^{208}c^{-200} - 10a^3b^{209}c^{-201} + 10a^3b^{210}c^{-202} - 10a^3b^{211}c^{-203} + 10a^3b^{212}c^{-204} - 10a^3b^{213}c^{-205} + 10a^3b^{214}c^{-206} - 10a^3b^{215}c^{-207} + 10a^3b^{216}c^{-208} - 10a^3b^{217}c^{-209} + 10a^3b^{218}c^{-210} - 10a^3b^{219}c^{-211} + 10a^3b^{220}c^{-212} - 10a^3b^{221}c^{-213} + 10a^3b^{222}c^{-214} - 10a^3b^{223}c^{-215} + 10a^3b^{224}c^{-216} - 10a^3b^{225}c^{-217} + 10a^3b^{226}c^{-218} - 10a^3b^{227}c^{-219} + 10a^3b^{228}c^{-220} - 10a^3b^{229}c^{-221} + 10a^3b^{230}c^{-222} - 10a^3b^{231}c^{-223} + 10a^3b^{232}c^{-224} - 10a^3b^{233}c^{-225} + 10a^3b^{234}c^{-226} - 10a^3b^{235}c^{-227} + 10a^3b^{236}c^{-228} - 10a^3b^{237}c^{-229} + 10a^3b^{238}c^{-230} - 10a^3b^{239}c^{-231} + 10a^3b^{240}c^{-232} - 10a^3b^{241}c^{-233} + 10a^3b^{242}c^{-234} - 10a^3b^{243}c^{-235} + 10a^3b^{244}c^{-236} - 10a^3b^{245}c^{-237} + 10a^3b^{246}c^{-238} - 10a^3b^{247}c^{-239} + 10a^3b^{248}c^{-240} - 10a^3b^{249}c^{-241} + 10a^3b^{250}c^{-242} - 10a^3b^{251}c^{-243} + 10a^3b^{252}c^{-244} - 10a^3b^{253}c^{-245} + 10a^3b^{254}c^{-246} - 10a^3b^{255}c^{-247} + 10a^3b^{256}c^{-248} - 10a^3b^{257}c^{-249} + 10a^3b^{258}c^{-250} - 10a^3b^{259}c^{-251} + 10a^3b^{260}c^{-252} - 10a^3b^{261}c^{-253} + 10a^3b^{262}c^{-254} - 10a^3b^{263}c^{-255} + 10a^3b^{264}c^{-256} - 10a^3b^{265}c^{-257} + 10a^3b^{266}c^{-258} - 10a^3b^{267}c^{-259} + 10a^3b^{268}c^{-260} - 10a^3b^{269}c^{-261} + 10a^3b^{270}c^{-262} - 10a^3b^{271}c^{-263} + 10a^3b^{272}c^{-264} - 10a^3b^{273}c^{-265} + 10a^3b^{274}c^{-266} - 10a^3b^{275}c^{-267} + 10a^3b^{276}c^{-268} - 10a^3b^{277}c^{-269} + 10a^3b^{278}c^{-270} - 10a^3b^{279}c^{-271} + 10a^3b^{280}c^{-272} - 10a^3b^{281}c^{-273} + 10a^3b^{282}c^{-274} - 10a^3b^{283}c^{-275} + 10a^3b^{284}c^{-276} - 10a^3b^{285}c^{-277} + 10a^3b^{286}c^{-278} - 10a^3b^{287}c^{-279} + 10a^3b^{288}c^{-280} - 10a^3b^{289}c^{-281} + 10a^3b^{290}c^{-282} - 10a^3b^{291}c^{-283} + 10a^3b^{292}c^{-284} - 10a^3b^{293}c^{-285} + 10a^3b^{294}c^{-286} - 10a^3b^{295}c^{-287} + 10a^3b^{296}c^{-288} - 10a^3b^{297}c^{-289} + 10a^3b^{298}c^{-290} - 10a^3b^{299}c^{-291} + 10a^3b^{300}c^{-292} - 10a^3b^{301}c^{-293} + 10a^3b^{302}c^{-294} - 10a^3b^{303}c^{-295} + 10a^3b^{304}c^{-296} - 10a^3b^{305}c^{-297} + 10a^3b^{306}c^{-298} - 10a^3b^{307}c^{-299} + 10a^3b^{308}c^{-300} - 10a^3b^{309}c^{-301} + 10a^3b^{310}c^{-302} - 10a^3b^{311}c^{-303} + 10a^3b^{312}c^{-304} - 10a^3b^{313}c^{-305} + 10a^3b^{314}c^{-306} - 10a^3b^{315}c^{-307} + 10a^3b^{316}c^{-308} - 10a^3b^{317}c^{-309} + 10a^3b^{318}c^{-310} - 10a^3b^{319}c^{-311} + 10a^3b^{320}c^{-312} - 10a^3b^{321}c^{-313} + 10a^3b^{322}c^{-314} - 10a^3b^{323}c^{-315} + 10a^3b^{324}c^{-316} - 10a^3b^{325}c^{-317} + 10a^3b^{326}c^{-318} - 10a^3b^{327}c^{-319} + 10a^3b^{328}c^{-320} - 10a^3b^{329}c^{-321} + 10a^3b^{330}c^{-322} - 10a^3b^{331}c^{-323} + 10a^3b^{332}c^{-324} - 10a^3b^{333}c^{-325} + 10a^3b^{334}c^{-326} - 10a^3b^{335}c^{-327} + 10a^3b^{336}c^{-328} - 10a^3b^{337}c^{-329} + 10a^3b^{338}c^{-330} - 10a^3b^{339}c^{-331} + 10a^3b^{340}c^{-332} - 10a^3b^{341}c^{-333} + 10a^3b^{342}c^{-334} - 10a^3b^{343}c^{-335} + 10a^3b^{344}c^{-336} - 10a^3b^{345}c^{-337} + 10a^3b^{346}c^{-338} - 10a^3b^{347}c^{-339} + 10a^3b^{348}c^{-340} - 10a^3b^{349}c^{-341} + 10a^3b^{350}c^{-342} - 10a^3b^{351}c^{-343} + 10a^3b^{352}c^{-344} - 10a^3b^{353}c^{-345} + 10a^3b^{354}c^{-346} - 10a^3b^{355}c^{-347} + 10a^3b^{356}c^{-348} - 10a^3b^{357}c^{-349} + 10a^3b^{358}c^{-350} - 10a^3b^{359}c^{-351} + 10a^3b^{360}c^{-352} - 10a^3b^{361}c^{-353} + 10a^3b^{362}c^{-354} - 10a^3b^{363}c^{-355} + 10a^3b^{364}c^{-356} - 10a^3b^{365}c^{-357} + 10a^3b^{366}c^{-358} - 10a^3b^{367}c^{-359} + 10a^3b^{368}c^{-360} - 10a^3b^{369}c^{-361} + 10a^3b^{370}c^{-362} - 10a^3b^{371}c^{-363} + 10a^3b^{372}c^{-364} - 10a^3b^{373}c^{-365} + 10a^3b^{374}c^{-366} - 10a^3b^{375}c^{-367} + 10a^3b^{376}c^{-368} - 10a^3b^{377}c^{-369} + 10a^3b^{378}c^{-370} - 10a^3b^{379}c^{-371} + 10a^3b^{380}c^{-372} - 10a^3b^{381}c^{-373} + 10a^3b^{382}c^{-374} - 10a^3b^{383}c^{-375} + 10a^3b^{384}c^{-376} - 10a^3b^{385}c^{-377} + 10a^3b^{386}c^{-378} - 10a^3b^{387}c^{-379} + 10a^3b^{388}c^{-380} - 10a^3b^{389}c^{-381} + 10a^3b^{390}c^{-382} - 10a^3b^{391}c^{-383} + 10a^3b^{392}c^{-384} - 10a^3b^{393}c^{-385} + 10a^3b^{394}c^{-386} - 10a^3b^{395}c^{-387} + 10a^3b^{396}c^{-388} - 10a^3b^{397}c^{-389} + 10a^3b^{398}c^{-390} - 10a^3b^{399}c^{-391} + 10a^3b^{400}c^{-392} - 10a^3b^{401}c^{-393} + 10a^3b^{402}c^{-394} - 10a^3b^{403}c^{-395} + 10a^3b^{404}c^{-396} - 10a^3b^{405}c^{-397} + 10a^3b^{406}c^{-398} - 10a^3b^{407}c^{-399} + 10a^3b^{408}c^{-400} - 10a^3b^{409}c^{-401} + 10a^3b^{410}c^{-402} - 10a^3b^{411}c^{-403} + 10a^3b^{412}c^{-404} - 10a^3b^{413}c^{-405} + 10a^3b^{414}c^{-406} - 10a^3b^{415}c^{-407} + 10a^3b^{416}c^{-408} - 10a^3b^{417}c^{-409} + 10a^3b^{418}c^{-410} - 10a^3b^{419}c^{-411} + 10a^3b^{420}c^{-412} - 10a^3b^{421}c^{-413} + 10a^3b^{422}c^{-414} - 10a^3b^{423}c^{-415} + 10a^3b^{424}c^{-416} - 10a^3b^{425}c^{-417} + 10a^3b^{426}c^{-418} - 10a^3b^{427}c^{-419} + 10a^3b^{428}c^{-420} - 10a^3b^{429}c^{-421} + 10a^3b^{430}c^{-422} - 10a^3b^{431}c^{-423} + 10a^3b^{432}c^{-424} - 10a^3b^{433}c^{-425} + 10a^3b^{434}c^{-426} - 10a^3b^{435}c^{-427} + 10a^3b^{436}c^{-428} - 10a^3b^{437}c^{-429} + 10a^3b^{438}c^{-430} - 10a^3b^{439}c^{-431} + 10a^3b^{440}c^{-432} - 10a^3b^{441}c^{-433} + 10a^3b^{442}c^{-434} - 10a^3b^{443}c^{-435} + 10a^3b^{444}c^{-436} - 10a^3b^{445}c^{-437} + 10a^3b^{446}c^{-438} - 10a^3b^{447}c^{-439} + 10a^3b^{448}c^{-440} - 10a^3b^{449}c^{-441} + 10a^3b^{450}c^{-442} - 10a^3b^{451}c^{-443} + 10a^3b^{452}c^{-444} - 10a^3b^{453}c^{-445} + 10a^3b^{454}c^{-446} - 10a^3b^{455}c^{-447} + 10a^3b^{456}c^{-448} - 10a^3b^{457}c^{-449} + 10a^3b^{458}c^{-450} - 10a^3b^{459}c^{-451} + 10a^3b^{460}c^{-452} - 10a^3b^{461}c^{-453} + 10a^3b^{462}c^{-454} - 10a^3b^{463}c^{-455} + 10a^3b^{464}c^{-456} - 10a^3b^{465}c^{-457} + 10a^3b^{466}c^{-458} - 10a^3b^{467}c^{-459} + 10a^3b^{468}c^{-460} - 10a^3b^{469}c^{-461} + 10a^3b^{470}c^{-462} - 10a^3b^{471}c^{-463} + 10a^3b^{472}c^{-464} - 10a^3b^{473}c^{-465} + 10a^3b^{474}c^{-466} - 10a^3b^{475}c^{-467} + 10a^3b^{476}c^{-468} - 10a^3b^{477}c^{-469} + 10a^3b^{478}c^{-470} - 10a^3b^{479}c^{-471} + 10a^3b^{480}c^{-472} - 10a^3b^{481}c^{-473} + 10a^3b^{482}c^{-474} - 10a^3b^{483}c^{-475} + 10a^3b^{484}c^{-476} - 10a^3b^{485}c^{-477} + 10a^3b^{486}c^{-478} - 10a^3b^{487}c^{-479} + 10a^3b^{488}c^{-480} - 10a^3b^{489}c^{-481} + 10a^3b^{490}c^{-482} - 10a^3b^{491}c^{-483} + 10a^3b^{492}c^{-484} - 10a^3b^{493}c^{-485} + 10a^3b^{494}c^{-486} - 10a^3b^{495}c^{-487} + 10a^3b^{496}c^{-488} - 10a^3b^{497}c^{-489} + 10a^3b^{498}c^{-490} - 10a^3b^{499}c^{-491} + 10a^3b^{500}c^{-492} - 10a^3b^{501}c^{-493} + 10a^3b^{502}c^{-494} - 10a^3b^{503}c^{-495} + 10a^3b^{504}c^{-496} - 10a^3b^{505}c^{-497} + 10a^3b^{506}c^{-498} - 10a^3b^{507}c^{-499} + 10a^3b^{508}c^{-500} - 10a^3b^{509}c^{-501} + 10a^3b^{510}c^{-502} - 10a^3b^{511}c^{-503} + 10a^3b^{512}c^{-504} - 10a^3b^{513}c^{-505} + 10a^3b^{514}c^{-506} - 10a^3b^{515}c^{-507} + 10a^3b^{516}c^{-508} - 10a^3b^{517}c^{-509} + 10a^3b^{518}c^{-510} - 10a^3b^{519}c^{-511} + 10a^3b^{520}c^{-512} - 10a^3b^{521}c^{-513} + 10a^3b^{522}c^{-514} - 10a^3b^{523}c^{-515} + 10a^3b^{524}c^{-516} - 10a^3b^{525}c^{-517} + 10a^3b^{526}c^{-518} - 10a^3b^{527}c^{-519} + 10a^3b^{528}c^{-520} - 10a^3b^{529}c^{-521} + 10a^3b^{530}c^{-522} - 10a^3b^{531}c^{-523} + 10a^3b^{532}c^{-524} - 10a^3b^{533}c^{-525} + 10a^3b^{534}c^{-526} - 10a^3b^{535}c^{-527} + 10a^3b^{536}c^{-528} - 10a^3b^{537}c^{-529} + 10a^3b^{538}c^{-530} - 10a^3b^{539}c^{-531} + 10a^3b^{540}c^{-532} - 10a^3b^{541}c$

$$\begin{aligned}
& \left( -3 - 2a^3b^6c^2 + 11a^4b^2c^5 + 15a^4b^3c^4 + 14a^4b^4c^3 - 27a^5b^2c^4 \right) / c^4 \cdot \left( (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^2(-4ac - b^2)^3)^{1/2} - 4ab^3c(-4ac - b^2)^3)^{1/2} + 2a^3b^2c(-4ac - b^2)^3)^{1/2} \right) / (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 \cdot \left( (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^2(-4ac - b^2)^3)^{1/2} - 4ab^3c(-4ac - b^2)^3)^{1/2} + 2a^3b^2c(-4ac - b^2)^3)^{1/2} \right) / (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 \cdot \left( (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^2(-4ac - b^2)^3)^{1/2} - 4ab^3c(-4ac - b^2)^3)^{1/2} + 2a^3b^2c(-4ac - b^2)^3)^{1/2} \right) / (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^2(-4ac - b^2)^3)^{1/2} - 4ab^3c(-4ac - b^2)^3)^{1/2} + 2a^3b^2c(-4ac - b^2)^3)^{1/2} \right) / (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
\end{aligned}$$



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

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

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

$$\begin{aligned}
& 33a^2b^4c^2 - 38a^3b^2c^3 - 18a^4b^2c^2 - 10ab^6c + 3a^2b^2c^2 \\
& *(-4ac - b^2)^3)^{1/2} - 4ab^3c*(-4ac - b^2)^3)^{1/2} + 2a^3b^2c^2 \\
& (-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 - 8 \\
& a^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 + 10 \\
& a^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^4 \\
& c^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^2*(-4ac - b^2)^3)^{1/2} - 4ab^3c*(-4ac - b^ \\
& 2)^3)^{1/2} + 2a^3b^2c^2*(-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^7* \\
& c^2 - 6ab^6c^2 - 20a^2b^6c + 40a^3b^5c - 35a^4b^4c + 14a^5b^3 \\
& *c - 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 + 10 \\
& a^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^2 \\
& c^2*(-4ac - b^2)^3)^{1/2} - 4ab^3c*(-4ac - b^2)^3)^{1/2} + 2a^3b \\
& ^2c^2*(-4ac - b^2)^3)^{1/2})/(2(16a^2c^8 + 32a^3c^7 + 16a^4c^6 + b^4 \\
& c^6 - b^6c^4 - 8ab^2c^7 + 10ab^4c^5 - 32a^2b^2c^6 + a^2b^4c^4 \\
& - 8a^3b^2c^5)))^{1/2} - (16384*(a^7b + a^3b^5 - 4a^4b^4 + 6a^5b^3 \\
& - 4a^6b^2 - a^3b^4c + 2a^4b^3c - 2a^5b^2c + a^4b^2c^2 + a^6b^2c \\
& ))/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 - 38 \\
& a^3b^2c^3 - 18a^4b^2c^2 - 10ab^6c + 3a^2b^2c^2*(-4ac - b^2)^3) \\
& ^{1/2} - 4ab^3c*(-4ac - b^2)^3)^{1/2} + 2a^3b^2c^2*(-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} \\
& *2i - \operatorname{atan}(((((((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^6 \\
& c - 3a^2b^2c^2*(-4ac - b^2)^3)^{1/2} + 4ab^3c*(-4ac - b^2)^3) \\
& ^{1/2} - 2a^3b^2c^2*(-4ac - b^2)^3)^{1/2})/(2(16a^2c^8 + 32a^3c^7 + 1
\end{aligned}$$



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

$$\begin{aligned}
& 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5* \\
& b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c)) / c^4 * ((b^8 - a^2*b^6 + 8*a^4*c^4 + 8 \\
& *a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - \\
& b^2)^3)^{(1/2)} + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6 \\
& *c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1 \\
& /2)} - 2*a^3*b*c*(-(4*a*c - b^2)^3)^{(1/2)}) / (2*(16*a^2*c^8 + 32*a^3*c^7 + 16* \\
& a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + \\
& a^2*b^4*c^4 - 8*a^3*b^2*c^5))^{(1/2)} + (8192*\tan(x/2)*(5*a*b^8 + b^8*c - b \\
& ^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6* \\
& a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6 \\
& *b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18* \\
& a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2* \\
& c^2 + 2*a*b^7*c)) / c^4 * ((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a \\
& *c - b^2)^3)^{(1/2)} + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^{(1/2)} + 33*a^ \\
& 2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4 \\
& *a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)} - 2*a^3*b*c*(-(4* \\
& a*c - b^2)^3)^{(1/2)}) / (2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b \\
& ^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3* \\
& b^2*c^5))^{(1/2)} * 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 - 3 \\
& 2*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 - 6 \\
& 8*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 - 3 \\
& 8*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^
\end{aligned}$$

$$\begin{aligned}
& 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^5*c + 2*a^4*b^5*c + 10*a^5*b*c^4 + 8*a^6*b*c^3 + 4*a^2*b^2*c^6 - 28*a^2*b^3*c^5 + 57*a^2*b^4*c^4 - 3*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 3*a^3*b^2*c^5 - 55*a^3*b^3*c^4 + 91*a^3*b^4*c^3 + 4*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 36*a^4*b^3*c^3 + 25*a^4*b^4*c^2 - 20*a^5*b^2*c^3 - 10*a^5*b^3*c^2 + 5*a*b^8*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^{(1/2)} + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)} - 2*a^3*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^{(1/2)} - (8192*tan(x/2)*(5*a*b^8 + b^8*c - b^9 - 10*a^2*b^7 + 10*a^3*b^6 - 5*a^4*b^5 + a^5*b^4 + a^6*c^3 + a^7*c^2 - 6*a*b^6*c^2 - 20*a^2*b^6*c + 40*a^3*b^5*c - 35*a^4*b^4*c + 14*a^5*b^3*c - a^6*b*c^2 - 2*a^6*b^2*c + 9*a^2*b^4*c^3 + 11*a^2*b^5*c^2 - 2*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 5*a^3*b^4*c^2 + 10*a^4*b^2*c^3 - 20*a^4*b^3*c^2 + 10*a^5*b^2*c^2 + 2*a*b^7*c))/c^4)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^{(1/2)} + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)} - 2*a^3*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^{(1/2)} + (((((8192*(4*a^2*c^10 - 4*a^3*c^9 - 20*a^4*c^8 - 12*a^5*c^7 + b^4*c^8 - 5*b^5*c^7 + 7*b^6*c^6 - 3*b^7*c^5 - 5*a*b^2*c^9 + 31*a*b^3*c^8 - 46*a*b^4*c^7 + 15*a*b^5*c^6 + 5*a*b^6*c^5 - 44*a^2*b*c^9 - 64*a^3*b*c^8 - 28*a^4*b*c^7 - 8*a^5*b*c^6 + 73*a^2*b^2*c^8 + 4*a^2*b^3*c^7 - 40*a^2*b^4*c^6 + a^2*b^5*c^5 + 85*a^3*b^2*c^7 + 3*a^3*b^3*c^6 - 5*a^3*b^4*c^5 + 23*a^4*b^2*c^6 + 2*a^4*b^3*c^5))/c^4 + (8192*tan(x/2)*((b^8 - a^2*b^6 + 8*a^4*c^4 + 8*a^5*c^3 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} + 8*a^3*b^4*c + a^2*b^3*(-(4*a*c - b^2)^3)^{(1/2)} + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - 18*a^4*b^2*c^2 - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)} - 2*a^3*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^8 + 32*a^3*c^7 + 16*a^4*c^6 + b^4*c^6 - b^6*c^4 - 8*a*b^2*c^7 + 10*a*b^4*c^5 - 32*a^2*b^2*c^6 + a^2*b^4*c^4 - 8*a^3*b^2*c^5)))^{(1/2)}*(8*a*c^12 - 16*a^2*c^11 - 32*a^3*c^10 + 16*a^4*c^9 + 24*a^5*c^8 - 2*b^2*c^11 + 6*b^3*c^10 - 8*b^4*c^9
\end{aligned}$$



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



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

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

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

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

Antiderivative was successfully verified.

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

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

**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 + (

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

### Rule 3257

$\text{Int}[\cos[(d_.) + (e_.)*(x_)]^{(m_.)}*((a_.) + \cos[(d_.) + (e_.)*(x_)]^{(n_.)}*(b_.) + \cos[(d_.) + (e_.)*(x_)]^{(n2_.)}*(c_.)^{(p_.)}], x\_Symbol] :> \text{Int}[\text{ExpandTrig}[\cos[d + e*x]^m*(a + b*\cos[d + e*x]^n + c*\cos[d + e*x]^{(2*n)})^p, x], x] /;$   
 $\text{FreeQ}\{a, b, c, d, e\}, x] \&\& \text{EqQ}[n2, 2*n] \&\& \text{NeQ}[b^2 - 4*a*c, 0] \&\& \text{IntegersQ}[m, n, p]$

### Rule 3293

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

### 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

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

c

Antiderivative was successfully verified.

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

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





$$\begin{aligned}
& 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}\*



$$\begin{aligned}
& 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)*\text{abs}(a - b + c) \\
& *\text{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)*\text{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^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
\end{aligned}$$

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



$$\begin{aligned}
& (a - b + c))\sqrt{b^2 - 4ac}a^2c^5 + 4(b^2 - 4ac)a^2c^5 - 7\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}a^2b^2c^5 - 6(b^2 - 4ac)a^2b^2c^5 - 5\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}a^2b^2c^5 - 2(b^2 - 4ac)b^2c^5 + 10\sqrt{a^2 - ab + bc - c^2 + \sqrt{b^2 - 4ac}}(a - b + c)\sqrt{b^2 - 4ac}a^2c^6 + 4(b^2 - 4ac)a^2c^6) \operatorname{abs}(a - b + c)) \cdot (\pi \operatorname{floor}(1/2x/\pi + 1/2) + \arctan(2\sqrt{1/2}\tan(1/2x)/\sqrt{(2ac - 2c^2 - \sqrt{-4(ac + bc + c^2)}(ac - bc + c^2) + 4(ac - c^2)^2))/(ac - bc + c^2)))) / ((3a^6b^2c^2 - 8a^5b^3c^2 - a^4b^4c^2 + 16a^3b^5c^2 - 7a^2b^6c^2 - 8ab^7c^2 + 5b^8c^2 - 12a^7c^3 + 32a^6b^2c^3 + 30a^5b^2c^3 - 112a^4b^3c^3 + 8a^3b^4c^3 + 96a^2b^5c^3 - 26ab^6c^3 - 16b^7c^3 - 104a^6c^4 + 192a^5b^2c^4 + 149a^4b^2c^4 - 336a^3b^3c^4 - 30a^2b^4c^4 + 112ab^5c^4 + 17b^6c^4 - 276a^5c^5 + 320a^4b^2c^5 + 292a^3b^2c^5 - 224a^2b^3c^5 - 120ab^4c^5 - 304a^4c^6 + 128a^3b^2c^6 + 237a^2b^2c^6 + 24ab^3c^6 - 17b^4c^6 - 116a^3c^7 - 96a^2b^2c^7 + 62ab^2c^7 + 16b^3c^7 + 24a^2c^8 - 64ab^2c^8 - 5b^2c^8 + 20ac^9) \operatorname{abs}(c))
\end{aligned}$$

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

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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



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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $(2*\text{atan}((540672*a^4*\tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (16384*b^4*\tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (147456*a^5*\tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) - (16384*b^5*\tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) - (360448*a^2*b^2*\tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (262144*a^2*c^2*\tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (49152*a*b^4*\tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216$

$$\begin{aligned}
& *a^3*b*c) - (147456*a^4*b*\tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) - (32768*a*b^5*\tan(x/2))/(147456*a^5*c - 32768*a*b^5 - 16384*b^5*c + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 + 262144*a^2*c^4 + 655360*a^3*c^3 + 540672*a^4*c^2 + 16384*b^4*c^2 - 131072*a*b^2*c^3 + 131072*a*b^3*c^2 - 262144*a^2*b*c^3 + 229376*a^2*b^3*c - 393216*a^3*b*c^2 - 262144*a^3*b^2*c - 360448*a^2*b^2*c^2 + 49152*a*b^4*c - 147456*a^4*b*c) + (229376*a^2*b^3*\tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) - (262144*a^3*b^2*\tan(x/2))/(49152*a*b^4 - 147456*a^4*b + 540672*a^4*c + 16384*b^4*c + 147456*a^5 - 16384*b^5 + 229376*a^2*b^3 - 262144*a^3*b^2 + 262144*a^2*c^3 + 655360*a^3*c^2 - 131072*a*b^2*c^2 - 262144*a^2*b*c^2 - 360448*a^2*b^2*c - (32768*a*b^5)/c + (32768*a^2*b^4)/c + (32768*a^3*b^3)/c - (32768*a^4*b^2)/c + 131072*a*b^3*c - 393216*a^3*b*c) + (131072*a*b^3*\tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) - (393216*a^3*b*\tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (655360*a^3*c*\tan(x/2))/(131072*a*b^3 - 393216*a^3*b + 655360*a^3*c + 540672*a^4 + 16384*b^4 - 360448*a^2*b^2 + 262144*a^2*c^2 + (147456*a^5)/c - (16384*b^5)/c + (49152*a*b^4)/c - (147456*a^4*b)/c - (32768*a*b^5)/c^2 + (229376*a^2*b^3)/c - (262144*a^3*b^2)/c + (32768*a^2*b^4)/c^2 + (32768*a^3*b^3)/c^2 - (32768*a^4*b^2)/c^2 - 131072*a*b^2*c - 262144*a^2*b*c) + (32768*a^2*b^4*\tan(x/2))/(147456*a^5*c - 32768*a*b^5 - 16384*b^5*c + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 + 262144*a^2*c^4 + 655360*a^3*c^3 + 540672*a^4*c^2 + 16384*b^4*c^2 - 131072*a*b^2*c^3 + 131072*a*b^3*c^2 - 262144*a^2*b*c^3 + 229376*a^2*b^3*c - 393216*a^3*b*c^2 - 262144*a^3*b^2*c - 360448*a^2*b^2*c^2 + 49152*a*b^4*c - 147456*a^4*b*c) - (32768*a^4*b^2*\tan(x/2))/(147456*a^5*c - 32768*a*b^5 - 16384*b^5*c + 32768*a^2*b^4 + 32768*a^3*b^3 - 32768*a^4*b^2 + 262144*a^2*c^4 + 655360*a^3*c^3 + 540672*a^4*c^2 + 16384*b^4*c^2 + 16384*b^4*c)
\end{aligned}$$

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

$$\begin{aligned}
& a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c \\
& + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 \\
& + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 \\
& - 8*a^3*b^2*c^3)))^{(1/2)} - 32768*a*b^5 + 24576*a^5*c - 49152*b^5*c + \\
& 24576*b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 + \\
& 253952*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^2 - 155648*a* \\
& b^2*c^3 + 262144*a*b^3*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a \\
& ^3*b*c^2 + 24576*a^3*b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b \\
& ^4*c - 122880*a^4*b*c) - \tan(x/2)*(40960*a*b^4 - 57344*a^4*b - 73728*a^4*c \\
& + 8192*b^4*c + 24576*a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^3*b^2 + 16384 \\
& *a^2*c^3 - 81920*a^3*c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 - 81920*a^2*b^ \\
& 2*c + 163840*a^3*b*c))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4* \\
& a*c - b^2)^3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - 18*a^2 \\
& *b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 3 \\
& 2*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 3 \\
& 2*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^{(1/2)}*1i - ((-(a^2*b^4 - b^6 \\
& + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^{(1/2)} + a^2*b*(-(4*a*c - \\
& b^2)^3)^{(1/2)} - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c \\
& - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6* \\
& c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2 \\
& *c^3)))^{(1/2)}*(24576*a^5*c - 32768*a*b^5 - (\tan(x/2)*(16384*a*b^6 - 65536*a \\
& *c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 245760*a^2 \\
& *c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b^2*c^5 - 4 \\
& 9152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 + 475136*a* \\
& b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c - 1081344* \\
& a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 557056*a^ \\
& 2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b*c^5 + 9830 \\
& 4*a*b^5*c) - (-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2) \\
& ^3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + \\
& 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 \\
& + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2* \\
& c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^{(1/2)}*(229376*a^2*c^6 + 557056*a^3*c^5 \\
& + 425984*a^4*c^4 + 98304*a^5*c^3 - 8192*b^3*c^5 + 40960*b^4*c^4 - 57344*b^ \\
& 5*c^3 + 24576*b^6*c^2 - 221184*a*b^2*c^5 + 327680*a*b^3*c^4 - 90112*a*b^4*c \\
& ^3 - 49152*a*b^5*c^2 - 393216*a^2*b*c^5 - 622592*a^3*b*c^4 - 196608*a^4*b*c \\
& ^3 + \tan(x/2)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2) \\
& ^3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - 18*a^2*b^2*c^2 \\
& + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 \\
& + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2 \\
& *c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^{(1/2)}*(65536*a*c^8 - 131072*a^2*c^7 - \\
& 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 + 49152*b \\
& ^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^7*c^2 + 29 \\
& 4912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b^5*c^3 - 1 \\
& 6384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4*b*c^4 - 65 \\
& 5360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384*a^2*b^5*c
\end{aligned}$$

$$\begin{aligned}
&^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 \\
&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)}*i)/((( -(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3* \\
&(-(4*a*c - b^2)^3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - 1 \\
&8*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^ \\
&6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^ \\
&3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^{(1/2)}*((\tan(x/2)*(16384 \\
&*a*b^6 - 65536*a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3* \\
&b^4 + 245760*a^2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 1 \\
&6384*b^2*c^5 - 49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2 \\
&*c^4 + 475136*a*b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2* \\
&b^4*c - 1081344*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b \\
&^2*c + 557056*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 19660 \\
&8*a*b*c^5 + 98304*a*b^5*c) - (-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3 \\
&*(-(4*a*c - b^2)^3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - \\
&18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c \\
&^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c \\
&^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^{(1/2)}*(8192*b^3*c^5 - \\
&557056*a^3*c^5 - 425984*a^4*c^4 - 98304*a^5*c^3 - 229376*a^2*c^6 - 40960*b^ \\
&4*c^4 + 57344*b^5*c^3 - 24576*b^6*c^2 + 221184*a*b^2*c^5 - 327680*a*b^3*c^4 \\
&+ 90112*a*b^4*c^3 + 49152*a*b^5*c^2 + 393216*a^2*b*c^5 + 622592*a^3*b*c^4 \\
&+ 196608*a^4*b*c^3 + \tan(x/2)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^ \\
&3*(-(4*a*c - b^2)^3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - \\
&18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2* \\
&c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4* \\
&c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^{(1/2)}*(65536*a*c^8 - \\
&131072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b \\
&^2*c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16
\end{aligned}$$

$$\begin{aligned}
& 384*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 1146 \\
& 88*a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 6553 \\
& 6*a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - \\
& 16384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4 \\
& *c^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7) + 172032*a^2*b^2*c^4 - 352256*a \\
& ^2*b^3*c^3 + 106496*a^3*b^2*c^3 - 49152*a^3*b^3*c^2 + 24576*a^4*b^2*c^2 - 3 \\
& 2768*a*b*c^6))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^ \\
& 2)^3))^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 \\
& + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^ \\
& 5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^ \\
& 2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) - 32768*a*b^5 + 24576*a^5*c - \\
& 49152*b^5*c + 24576*b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98 \\
& 304*a^2*c^4 + 253952*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^ \\
& 2 - 155648*a*b^2*c^3 + 262144*a*b^3*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3 \\
& *c - 458752*a^3*b*c^2 + 24576*a^3*b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 \\
& - 114688*a*b^4*c - 122880*a^4*b*c) - \tan(x/2)*(40960*a*b^4 - 57344*a^4*b - \\
& 73728*a^4*c + 8192*b^4*c + 24576*a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^ \\
& 3*b^2 + 16384*a^2*c^3 - 81920*a^3*c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 - \\
& 81920*a^2*b^2*c + 163840*a^3*b*c))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^ \\
& 2 - b^3*(-(4*a*c - b^2)^3))^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b \\
& ^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(1 \\
& 6*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10* \\
& a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2) + ((- (a^2 \\
& *b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3))^(1/2) + a^2*b*( \\
& -(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b* \\
& c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c \\
& ^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - \\
& 8*a^3*b^2*c^3)))^(1/2)*(24576*a^5*c - 32768*a*b^5 - (\tan(x/2)*(16384*a*b^6 \\
& - 65536*a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + \\
& 245760*a^2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b \\
& ^2*c^5 - 49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 + \\
& 475136*a*b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c \\
& - 1081344*a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + \\
& 557056*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b* \\
& c^5 + 98304*a*b^5*c) - (- (a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4* \\
& a*c - b^2)^3))^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^2 \\
& *b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 + 3 \\
& 2*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 3 \\
& 2*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3)))^(1/2)*(229376*a^2*c^6 + 5570 \\
& 56*a^3*c^5 + 425984*a^4*c^4 + 98304*a^5*c^3 - 8192*b^3*c^5 + 40960*b^4*c^4 \\
& - 57344*b^5*c^3 + 24576*b^6*c^2 - 221184*a*b^2*c^5 + 327680*a*b^3*c^4 - 901 \\
& 12*a*b^4*c^3 - 49152*a*b^5*c^2 - 393216*a^2*b*c^5 - 622592*a^3*b*c^4 - 1966 \\
& 08*a^4*b*c^3 + \tan(x/2)*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4 \\
& *a*c - b^2)^3))^(1/2) + a^2*b*(-(4*a*c - b^2)^3)^(1/2) - 6*a^3*b^2*c - 18*a^ \\
& 2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(16*a^2*c^6 +
\end{aligned}$$

$$\begin{aligned}
& 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - \\
& 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3))^{(1/2)}*(65536*a*c^8 - 131072 \\
& *a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2*c^7 \\
& + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 16384*b^ \\
& 7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688*a*b \\
& ^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536*a^4* \\
& b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 16384 \\
& *a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c^2 - \\
& 114688*a^4*b^2*c^3 - 196608*a*b*c^7) - 172032*a^2*b^2*c^4 + 352256*a^2*b^3 \\
& *c^3 - 106496*a^3*b^2*c^3 + 49152*a^3*b^3*c^2 - 24576*a^4*b^2*c^2 + 32768*a \\
& *b*c^6))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3))^{(1/2)} \\
& + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a \\
& *b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16 \\
& *a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 \\
& + a^2*b^4*c^2 - 8*a^3*b^2*c^3))^{(1/2)} - 49152*b^5*c + 24576*b^6 - 16384*a^ \\
& 2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 + 253952*a^3*c^3 + 180 \\
& 224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^2 - 155648*a*b^2*c^3 + 262144*a*b^ \\
& 3*c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a^3*b*c^2 + 24576*a^3* \\
& b^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b^4*c - 122880*a^4*b*c \\
& ) + \tan(x/2)*(40960*a*b^4 - 57344*a^4*b - 73728*a^4*c + 8192*b^4*c + 24576* \\
& a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^3*b^2 + 16384*a^2*c^3 - 81920*a^3* \\
& c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 - 81920*a^2*b^2*c + 163840*a^3*b*c) \\
& )*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3))^{(1/2)} + \\
& a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c - 18*a^2*b^2*c^2 + 8*a*b^4*c \\
& + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^ \\
& 4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b \\
& ^4*c^2 - 8*a^3*b^2*c^3))^{(1/2)} - 65536*a^3*b + 49152*a^3*c + 49152*a^4 + 1 \\
& 6384*a^2*b^2 - 16384*a^2*b*c))*(-(a^2*b^4 - b^6 + 8*a^3*c^3 + 8*a^4*c^2 - b \\
& ^3*(-(4*a*c - b^2)^3))^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} - 6*a^3*b^2*c \\
& - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2 \\
& *c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4 \\
& *c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3))^{(1/2)}*2i + \operatorname{atan}(((\tan \\
& (x/2)*(40960*a*b^4 - 57344*a^4*b - 73728*a^4*c + 8192*b^4*c + 24576*a^5 - \\
& 8192*b^5 - 81920*a^2*b^3 + 81920*a^3*b^2 + 16384*a^2*c^3 - 81920*a^3*c^2 - \\
& 32768*a*b^2*c^2 + 81920*a^2*b*c^2 - 81920*a^2*b^2*c + 163840*a^3*b*c) + ((b \\
& ^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3))^{(1/2)} + a^2*b \\
& *(-(4*a*c - b^2)^3))^{(1/2)} + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a* \\
& b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^ \\
& 4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 \\
& - 8*a^3*b^2*c^3))^{(1/2)}*(24576*a^5*c - 32768*a*b^5 - 49152*b^5*c + 24576* \\
& b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 - 8192*a^4*b^2 + 98304*a^2*c^4 + 253952 \\
& *a^3*c^3 + 180224*a^4*c^2 - 8192*b^3*c^3 + 32768*b^4*c^2 + (((b^6 - a^2*b^4 \\
& - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3))^{(1/2)} + a^2*b*(-(4*a*c - \\
& b^2)^3))^{(1/2)} + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c \\
& - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*
\end{aligned}$$

$$\begin{aligned}
& c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2 \\
& *c^3))^{(1/2)}*(229376*a^2*c^6 + 557056*a^3*c^5 + 425984*a^4*c^4 + 98304*a^5 \\
& *c^3 - 8192*b^3*c^5 + 40960*b^4*c^4 - 57344*b^5*c^3 + 24576*b^6*c^2 - 22118 \\
& 4*a*b^2*c^5 + 327680*a*b^3*c^4 - 90112*a*b^4*c^3 - 49152*a*b^5*c^2 - 393216 \\
& *a^2*b*c^5 - 622592*a^3*b*c^4 - 196608*a^4*b*c^3 - 172032*a^2*b^2*c^4 + 352 \\
& 256*a^2*b^3*c^3 - 106496*a^3*b^2*c^3 + 49152*a^3*b^3*c^2 - 24576*a^4*b^2*c^ \\
& 2 + 32768*a*b*c^6 + \tan(x/2)*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3* \\
& (-4*a*c - b^2)^3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} + 6*a^3*b^2*c + 1 \\
& 8*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^ \\
& 6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^ \\
& 3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3))^{(1/2)}*(65536*a*c^8 - 13 \\
& 1072*a^2*c^7 - 262144*a^3*c^6 + 131072*a^4*c^5 + 196608*a^5*c^4 - 16384*b^2 \\
& *c^7 + 49152*b^3*c^6 - 65536*b^4*c^5 + 65536*b^5*c^4 - 49152*b^6*c^3 + 1638 \\
& 4*b^7*c^2 + 294912*a*b^2*c^6 - 409600*a*b^3*c^5 + 376832*a*b^4*c^4 - 114688 \\
& *a*b^5*c^3 - 16384*a*b^6*c^2 + 589824*a^2*b*c^6 + 720896*a^3*b*c^5 - 65536* \\
& a^4*b*c^4 - 655360*a^2*b^2*c^5 + 16384*a^2*b^3*c^4 + 196608*a^2*b^4*c^3 - 1 \\
& 6384*a^2*b^5*c^2 - 557056*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 16384*a^3*b^4*c \\
& ^2 - 114688*a^4*b^2*c^3 - 196608*a*b*c^7)) - \tan(x/2)*(16384*a*b^6 - 65536* \\
& a*c^6 + 49152*b^6*c - 16384*b^7 + 16384*a^2*b^5 - 16384*a^3*b^4 + 245760*a^ \\
& 2*c^5 + 671744*a^3*c^4 + 212992*a^4*c^3 - 147456*a^5*c^2 + 16384*b^2*c^5 - \\
& 49152*b^3*c^4 + 65536*b^4*c^3 - 65536*b^5*c^2 - 327680*a*b^2*c^4 + 475136*a \\
& *b^3*c^3 - 393216*a*b^4*c^2 - 802816*a^2*b*c^4 - 180224*a^2*b^4*c - 1081344 \\
& *a^3*b*c^3 - 65536*a^3*b^3*c + 49152*a^4*b*c^2 + 98304*a^4*b^2*c + 557056*a \\
& ^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 344064*a^3*b^2*c^2 + 196608*a*b*c^5 + 983 \\
& 04*a*b^5*c))*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^ \\
& 3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - \\
& 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 + \\
& 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c \\
& ^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3))^{(1/2)} - 155648*a*b^2*c^3 + 262144*a*b^3 \\
& *c^2 - 270336*a^2*b*c^3 + 237568*a^2*b^3*c - 458752*a^3*b*c^2 + 24576*a^3*b \\
& ^2*c + 16384*a^2*b^2*c^2 + 32768*a*b*c^4 - 114688*a*b^4*c - 122880*a^4*b*c) \\
& )*((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^{(1/2)} + \\
& a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + \\
& 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 \\
& + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^ \\
& 4*c^2 - 8*a^3*b^2*c^3))^{(1/2)}*1i + (\tan(x/2)*(40960*a*b^4 - 57344*a^4*b - \\
& 73728*a^4*c + 8192*b^4*c + 24576*a^5 - 8192*b^5 - 81920*a^2*b^3 + 81920*a^3 \\
& *b^2 + 16384*a^2*c^3 - 81920*a^3*c^2 - 32768*a*b^2*c^2 + 81920*a^2*b*c^2 - \\
& 81920*a^2*b^2*c + 163840*a^3*b*c) - ((b^6 - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 \\
& - b^3*(-(4*a*c - b^2)^3)^{(1/2)} + a^2*b*(-(4*a*c - b^2)^3)^{(1/2)} + 6*a^3*b^ \\
& 2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(16 \\
& *a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a \\
& *b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3))^{(1/2)}*(24576*a^5 \\
& *c - 32768*a*b^5 - 49152*b^5*c + 24576*b^6 - 16384*a^2*b^4 + 32768*a^3*b^3 \\
& - 8192*a^4*b^2 + 98304*a^2*c^4 + 253952*a^3*c^3 + 180224*a^4*c^2 - 8192*b^3
\end{aligned}$$



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

$$\begin{aligned}
& (b^4c^4 - b^6c^2 - 8ab^2c^5 + 10a^2b^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3))^{1/2} \cdot (24576a^5c - 32768ab^5 - 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 + ((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 - 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 + 10a^2b^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3))^{1/2} \cdot (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 - 90112a^2b^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) \cdot ((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 - 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 + 10a^2b^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3))^{1/2} \cdot (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) \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)) \cdot ((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 - 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 + 10a^2b^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3))^{1/2} - 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) \cdot ((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 - 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 + 10a^2b^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3))^{1/2} - (\tan(x/2) \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 -
\end{aligned}$$

$$\begin{aligned}
& 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 - 8ab^4c + 2abc(-4ac - b^2)^3)^{1/2}) / (2(16 \\
& a^2c^6 + 32a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10a \\
& b^4c^3 - 32a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} * (24576a^5 \\
& c - 32768ab^5 - 49152b^5c + 24576b^6 - 16384a^2b^4 + 32768a^3b^3 \\
& - 8192a^4b^2 + 98304a^2c^4 + 253952a^3c^3 + 180224a^4c^2 - 8192b^3 \\
& c^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^2 \\
& b^2c^2 - 8ab^4c + 2abc(-4ac - b^2)^3)^{1/2}) / (2(16a^2c^6 + 3 \\
& 2a^3c^5 + 16a^4c^4 + b^4c^4 - b^6c^2 - 8ab^2c^5 + 10ab^4c^3 - 3 \\
& 2a^2b^2c^4 + a^2b^4c^2 - 8a^3b^2c^3)))^{1/2} * (8192b^3c^5 - 557056 \\
& a^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 + 901 \\
& 12ab^4c^3 + 49152ab^5c^2 + 393216a^2b^5c^5 + 622592a^3b^5c^4 + 1966 \\
& 08a^4b^5c^3 + 172032a^2b^2c^4 - 352256a^2b^3c^3 + 106496a^3b^2c^3 \\
& - 49152a^3b^3c^2 + 24576a^4b^2c^2 - 32768abc^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 - 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 - 8 \\
& a^3b^2c^3)))^{1/2} * (65536ac^8 - 131072a^2c^7 - 262144a^3c^6 + 1310 \\
& 72a^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 - 40960 \\
& 0ab^3c^5 + 376832ab^4c^4 - 114688ab^5c^3 - 16384ab^6c^2 + 58982 \\
& 4a^2b^6c^6 + 720896a^3b^6c^5 - 65536a^4b^6c^4 - 655360a^2b^2c^5 + 163 \\
& 84a^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 \\
& c^7)) - \tan(x/2)(16384ab^6 - 65536ac^6 + 49152b^6c - 16384b^7 + 16 \\
& 384a^2b^5 - 16384a^3b^4 + 245760a^2c^5 + 671744a^3c^4 + 212992a^4c \\
& c^3 - 147456a^5c^2 + 16384b^2c^5 - 49152b^3c^4 + 65536b^4c^3 - 6553 \\
& 6b^5c^2 - 327680ab^2c^4 + 475136ab^3c^3 - 393216ab^4c^2 - 802816 \\
& a^2b^6c^4 - 180224a^2b^4c - 1081344a^3b^6c^3 - 65536a^3b^3c + 49152 \\
& a^4b^6c^2 + 98304a^4b^2c + 557056a^2b^2c^3 + 180224a^2b^3c^2 + 34 \\
& 4064a^3b^2c^2 + 196608abc^5 + 98304ab^5c)) * ((b^6 - a^2b^4 - 8a^3 \\
& c^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} - 155648ab^2c^3 + 262144ab^3c^2 - 270336a^2b^6c^3 + 237568a^2b^3c - 458752a^3b^6c^2 + 24576a^3b^2c + 16384a^2b^2c^2 + 32768ab^6c^4 - 114688ab^4c - 122880a^4b^6c)) * ((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 - 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 +
\end{aligned}$$

$$\begin{aligned} & (10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - 8*a^3*b^2*c^3))^{(1/2)} - 655 \\ & 36*a^3*b + 49152*a^3*c + 49152*a^4 + 16384*a^2*b^2 - 16384*a^2*b*c) * ((b^6 \\ & - a^2*b^4 - 8*a^3*c^3 - 8*a^4*c^2 - b^3*(-(4*a*c - b^2)^3)^{(1/2)} + a^2*b*(- \\ & (4*a*c - b^2)^3)^{(1/2)} + 6*a^3*b^2*c + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c \\ & *(-(4*a*c - b^2)^3)^{(1/2)}) / (2*(16*a^2*c^6 + 32*a^3*c^5 + 16*a^4*c^4 + b^4*c \\ & ^4 - b^6*c^2 - 8*a*b^2*c^5 + 10*a*b^4*c^3 - 32*a^2*b^2*c^4 + a^2*b^4*c^2 - \\ & 8*a^3*b^2*c^3))^{(1/2)} * 2i \end{aligned}$$

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

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

[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}

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

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

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

**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 +

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

**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] 
$$\begin{aligned} & -1/4*\text{sqrt}(2)*\text{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))*\text{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))*\text{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*\text{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))*\text{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))*\text{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))*\text{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*\text{sqrt}(2)*\text{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))*\text{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))*\text{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*\text{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))*\text{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))*\text{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))*\text{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}$$

$$\begin{aligned}
& - 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{-2a^2 - b^2 + 2ac + (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(-ab^2\cos(x) - 2ab^2c + (a^3b^2 - ab^4 - 4a^2c^3 - (8a^3 - ab^2)c^2 - 2(2a^4 - 3a^2b^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)}} * \cos(x) + 1/2\sqrt{2} * ((a^3b^3 - ab^5 + 4ab^2c^4 + (4a^2b - b^3)c^3 - (4a^3b + 5ab^3)c^2 - (4a^4b - 5a^2b^3 - b^5)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) - (ab^3 - 4ab^2c^2 - (4a^2b - b^3)c)}\sqrt{-2a^2 - b^2 + 2ac + (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{-2a^2 - b^2 + 2ac + (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(-ab^2\cos(x) - 2ab^2c + (a^3b^2 - ab^4 - 4a^2c^3 - (8a^3 - ab^2)c^2 - 2(2a^4 - 3a^2b^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)}} * \cos(x) - 1/2\sqrt{2} * ((a^3b^3 - ab^5 + 4ab^2c^4 + (4a^2b - b^3)c^3 - (4a^3b + 5ab^3)c^2 - (4a^4b - 5a^2b^3 - b^5)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) - (ab^3 - 4ab^2c^2 - (4a^2b - b^3)c)}\sqrt{-2a^2 - b^2 + 2ac + (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))
\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")





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

[Out] integrate(cos(x)/(c\*cos(x)^2 + b\*cos(x) + a), x)

**mupad [B]** time = 11.72, size = 5488, normalized size = 23.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] atan((((tan(x/2)\*(96\*a\*b^2 - 128\*a^2\*b - 64\*a\*c^2 + 32\*b^2\*c + 64\*a^3 - 32\*b^3) + ((8\*a^3\*c + b\*(-(4\*a\*c - b^2)^3)^(1/2) + b^4 - 2\*a^2\*b^2 + 8\*a^2\*c^2 - 6\*a\*b^2\*c)/(2\*(a^2\*b^4 - b^6 + 16\*a^2\*c^4 + 32\*a^3\*c^3 + 16\*a^4\*c^2 + b^4\*c^2 - 8\*a\*b^2\*c^3 - 8\*a^3\*b^2\*c - 32\*a^2\*b^2\*c^2 + 10\*a\*b^4\*c)))^(1/2)\*(64\*a\*b^3 + 128\*a\*c^3 + 128\*a^3\*c + 64\*b^3\*c - 32\*b^4 - 32\*a^2\*b^2 + 256\*a^2\*c^2 - 32\*b^2\*c^2 + tan(x/2)\*((8\*a^3\*c + b\*(-(4\*a\*c - b^2)^3)^(1/2) + b^4 - 2\*a^2\*b^2 + 8\*a^2\*c^2 - 6\*a\*b^2\*c)/(2\*(a^2\*b^4 - b^6 + 16\*a^2\*c^4 + 32\*a^3\*c^3 + 16\*a^4\*c^2 + b^4\*c^2 - 8\*a\*b^2\*c^3 - 8\*a^3\*b^2\*c - 32\*a^2\*b^2\*c^2 + 10\*a\*b^4\*c)))^(1/2)\*(64\*a\*b^4 + 256\*a\*c^4 - 256\*a^4\*c - 64\*b^4\*c - 128\*a^2\*b^3 + 64\*a^3\*b^2 + 256\*a^2\*c^3 - 256\*a^3\*c^2 - 64\*b^2\*c^3 + 128\*b^3\*c^2 + 192\*a\*b^2\*c^2 - 192\*a^2\*b^2\*c - 512\*a\*b\*c^3 + 512\*a^3\*b\*c) - 256\*a\*b\*c^2 + 64\*a\*b^2\*c - 256\*a^2\*b\*c))\*((8\*a^3\*c + b\*(-(4\*a\*c - b^2)^3)^(1/2) + b^4 - 2\*a^2\*b^2 + 8\*a^2\*c^2 - 6\*a\*b^2\*c)/(2\*(a^2\*b^4 - b^6 + 16\*a^2\*c^4 + 32\*a^3\*c^3 + 16\*a^4\*c^2 + b^4\*c^2 - 8\*a\*b^2\*c^3 - 8\*a^3\*b^2\*c - 32\*a^2\*b^2\*c^2 + 10\*a\*b^4\*c)))^(1/2)\*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 + ta



$$\begin{aligned}
& ^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 - \tan(x/2)*((8*a^3*c - b*(-(4*a*c - b^2)^3)^{(1/2)} + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{(1/2)}*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*((8*a^3*c - b*(-(4*a*c - b^2)^3)^{(1/2)} + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{(1/2)}*1i)/(64*a*c - 64*a*b + 64*a^2 - (\tan(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 - 32*b^3) + ((8*a^3*c - b*(-(4*a*c - b^2)^3)^{(1/2)} + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{(1/2)}*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 + \tan(x/2)*((8*a^3*c - b*(-(4*a*c - b^2)^3)^{(1/2)} + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{(1/2)}*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*((8*a^3*c - b*(-(4*a*c - b^2)^3)^{(1/2)} + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{(1/2)} + (\tan(x/2)*(96*a*b^2 - 128*a^2*b - 64*a*c^2 + 32*b^2*c + 64*a^3 - 32*b^3) - ((8*a^3*c - b*(-(4*a*c - b^2)^3)^{(1/2)} + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{(1/2)}*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 - \tan(x/2)*((8*a^3*c - b*(-(4*a*c - b^2)^3)^{(1/2)} + b^4 - 2*a^2*b^2 + 8*a^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{(1/2)}*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 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)}*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)/(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

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

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

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

Antiderivative was successfully verified.

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

[Out] (2\*sqrt[2]\*c\*(ArcTanh[((b - 2\*c + Sqrt[b^2 - 4\*a\*c])\*Tan[x/2])/Sqrt[-2\*b^2 + 4\*c\*(a + c) - 2\*b\*Sqrt[b^2 - 4\*a\*c]]]/Sqrt[-b^2 + 2\*c\*(a + c) - b\*Sqrt[b^2 - 4\*a\*c]] + ArcTanh[(-b + 2\*c + Sqrt[b^2 - 4\*a\*c])\*Tan[x/2])/Sqrt[-2\*b^2 + 4\*c\*(a + c) + 2\*b\*Sqrt[b^2 - 4\*a\*c]]]/Sqrt[-b^2 + 2\*c\*(a + c) + b\*Sqrt[b^2 - 4\*a\*c]]))/Sqrt[b^2 - 4\*a\*c]

**fricas** [B] time = 2.28, size = 3493, normalized size = 15.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a+b\*cos(x)+c\*cos(x)^2),x, algorithm="fricas")

[Out]  $\frac{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) + \frac{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)\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) - \frac{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)\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)} + \frac{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)}$



$$\begin{aligned}
& - (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 - (4a^2c^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 - (4a^2c^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))
\end{aligned}$$

**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] (2a^2b^3 - 2b^5 - 8a^3b\*c - 12a^2b^2\*c + 20ab^3\*c + 4b^4\*c + 48a^3c^2 - 48a^2b\*c^2 - 24ab^2\*c^2 - 6b^3\*c^2 + 32a^2c^3 + 24ab\*c^3 + 4b^2\*c^3 - 16ac^4 + 3\*sqrt(a^2 - a\*b + b\*c - c^2 + sqrt(b^2 - 4a\*c))\*(a - b + c))\*a^2b^2 - 2\*sqrt(a^2 - a\*b + b\*c - c^2 + sqrt(b^2 - 4a\*c))\*(a -

$$\begin{aligned}
& (b + c)) * a * b^3 - 5 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + \\
& c)) * b^4 - 12 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a^3 * c \\
& + 8 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a^2 * b * c \\
& + 34 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a * b^2 * c + \\
& 6 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * b^3 * c - 56 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a^2 * c^2 - 24 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a * b * c^2 - 5 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * b^2 * c^2 + 20 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a * c^3 + 3 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * a^2 * b - 2 * (b^2 - 4 * a * c) * a^2 * b - 2 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * a * b^2 - 5 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * b^3 + 2 * (b^2 - 4 * a * c) * b^3 + 6 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * a^2 * c + 12 * (b^2 - 4 * a * c) * a^2 * c + 10 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * a * b * c - 12 * (b^2 - 4 * a * c) * a * b * c - 4 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * b^2 * c - 4 * (b^2 - 4 * a * c) * b^2 * c + 28 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * a * c^2 + 8 * (b^2 - 4 * a * c) * a * c^2 + 7 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * b * c^2 + 6 * (b^2 - 4 * a * c) * b * c^2 - 10 * \sqrt{a^2 - a * b + b * c - c^2 + \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * c^3 - 4 * (b^2 - 4 * a * c) * c^3 * (\pi * \text{floor}(1/2 * x / \pi + 1/2) + \arctan(2 * \sqrt{1/2} * \tan(1/2 * x) / \sqrt{(2 * a - 2 * c + \sqrt{-4 * (a + b + c) * (a - b + c) + 4 * (a - c)^2}) / (a - b + c)}))) * \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) - (2 * a^2 * b^3 - 2 * b^5 - 8 * a^3 * b * c - 12 * a^2 * b^2 * c + 20 * a * b^3 * c + 4 * b^4 * c + 48 * a^3 * c^2 - 48 * a^2 * b * c^2 - 24 * a * b^2 * c^2 - 6 * b^3 * c^2 + 32 * a^2 * c^3 + 24 * a * b * c^3 + 4 * b^2 * c^3 - 16 * a * c^4 - 3 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a^2 * b^2 + 2 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a * b^3 + 5 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * b^4 + 12 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a^3 * c - 8 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a^2 * b * c - 34 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a * b^2 * c - 6 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * b^3 * c + 56 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a^2 * c^2 + 24 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a * b * c^2 + 5 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * b^2 * c^2 - 20 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * a * c^3 + 3 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c} * a^2 * b - 2 * (b^2 - 4 * a * c) * a^2 * b - 2 * \sqrt{a^2 - a * b + b * c - c^2 - \sqrt{b^2 - 4 * a * c}} * (a - b + c)) * \sqrt{b^2 - 4 * a * c}
\end{aligned}$$

```

)*a*b^2 - 5*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c))*(a - b + c))*sqr
t(b^2 - 4*a*c)*b^3 + 2*(b^2 - 4*a*c)*b^3 + 6*sqrt(a^2 - a*b + b*c - c^2 - s
qrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*a^2*c + 12*(b^2 - 4*a*c)*a^
2*c + 10*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b
^2 - 4*a*c)*a*b*c - 12*(b^2 - 4*a*c)*a*b*c - 4*sqrt(a^2 - a*b + b*c - c^2 -
sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b^2*c - 4*(b^2 - 4*a*c)*b
^2*c + 28*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(
b^2 - 4*a*c)*a*c^2 + 8*(b^2 - 4*a*c)*a*c^2 + 7*sqrt(a^2 - a*b + b*c - c^2 -
sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(b^2 - 4*a*c)*b*c^2 + 6*(b^2 - 4*a*c)*b
*c^2 - 10*sqrt(a^2 - a*b + b*c - c^2 - sqrt(b^2 - 4*a*c)*(a - b + c))*sqrt(
b^2 - 4*a*c)*c^3 - 4*(b^2 - 4*a*c)*c^3)*(pi*floor(1/2*x/pi + 1/2) + arctan(
2*sqrt(1/2)*tan(1/2*x)/sqrt((2*a - 2*c - sqrt(-4*(a + b + c)*(a - b + c) +
4*(a - c)^2))/(a - b + c))))*abs(a - b + c)/(3*a^5*b^2 - 5*a^4*b^3 - 6*a^3*
b^4 + 10*a^2*b^5 + 3*a*b^6 - 5*b^7 - 12*a^6*c + 20*a^5*b*c + 47*a^4*b^2*c -
60*a^3*b^3*c - 46*a^2*b^4*c + 40*a*b^5*c + 11*b^6*c - 92*a^5*c^2 + 80*a^4*
b*c^2 + 182*a^3*b^2*c^2 - 94*a^2*b^3*c^2 - 78*a*b^4*c^2 - 6*b^5*c^2 - 184*a
^4*c^3 + 56*a^3*b*c^3 + 166*a^2*b^2*c^3 + 36*a*b^3*c^3 - 6*b^4*c^3 - 120*a^
3*c^4 - 48*a^2*b*c^4 + 23*a*b^2*c^4 + 11*b^3*c^4 + 4*a^2*c^5 - 44*a*b*c^5 -
5*b^2*c^5 + 20*a*c^6)

```

**maple [B]** time = 0.10, size = 1262, normalized size = 5.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```

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

```

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

**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] 
$$\begin{aligned} & - \operatorname{atan}(((\tan(x/2) * (32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^2*c - 32*b^3 + 64 \\ & * c^3) + (-8*a*c^3 + b*(-4*a*c - b^2)^3)^{(1/2)} + b^4 + 8*a^2*c^2 - 2*b^2*c \\ & ^2 - 6*a*b^2*c) / (2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + \\ & b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{(1/2)} * \\ & (64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2 \\ & * c^2 - 32*b^2*c^2 + \tan(x/2) * (-8*a*c^3 + b*(-4*a*c - b^2)^3)^{(1/2)} + b^4 \\ & + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c) / (2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a \\ & ^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 \\ & + 10*a*b^4*c)))^{(1/2)} * (64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128*a^2 \\ & * b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + \\ & 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^2 + \\ & 64*a*b^2*c - 256*a^2*b*c) * (-8*a*c^3 + b*(-4*a*c - b^2)^3)^{(1/2)} + b^4 + \\ & 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c) / (2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3 \\ & * c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + \\ & 10*a*b^4*c)))^{(1/2)} * 1i + (\tan(x/2) * (32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^2 \\ & * c - 32*b^3 + 64*c^3) - (-8*a*c^3 + b*(-4*a*c - b^2)^3)^{(1/2)} + b^4 + 8* \end{aligned}$$



$$\begin{aligned}
& 2*c - 32*b^3 + 64*c^3) + (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^{1/2} + b^4 + 8* \\
& a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^ \\
& 3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10* \\
& a*b^4*c)))^{1/2}*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32 \\
& *a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 + \tan(x/2)*(-(8*a*c^3 - b*(-(4*a*c - b^ \\
& 2)^3)^{1/2} + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + \\
& 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c \\
& - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{1/2}*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - \\
& 64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^ \\
& 3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c \\
& ) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 - b*(-(4*a*c - b^2) \\
& ^3)^{1/2} + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16 \\
& *a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - \\
& 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{1/2}*1i + (\tan(x/2)*(32*a*b^2 - 64*a^2*c - \\
& 128*b*c^2 + 96*b^2*c - 32*b^3 + 64*c^3) - (-(8*a*c^3 - b*(-(4*a*c - b^2)^3) \\
& ^{1/2} + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^ \\
& 2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32* \\
& a^2*b^2*c^2 + 10*a*b^4*c)))^{1/2}*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^ \\
& 3*c - 32*b^4 - 32*a^2*b^2 + 256*a^2*c^2 - 32*b^2*c^2 - \tan(x/2)*(-(8*a*c^3 \\
& - b*(-(4*a*c - b^2)^3)^{1/2} + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2* \\
& (a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c \\
& ^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{1/2}*(64*a*b^4 + 256*a*c \\
& ^4 - 256*a^4*c - 64*b^4*c - 128*a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^ \\
& 3*c^2 - 64*b^2*c^3 + 128*b^3*c^2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b* \\
& c^3 + 512*a^3*b*c) - 256*a*b*c^2 + 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 - \\
& b*(-(4*a*c - b^2)^3)^{1/2} + b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a \\
& ^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 \\
& - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{1/2}*1i)/(64*a*c - 64*b*c \\
& + 64*c^2 + (\tan(x/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^2*c - 32*b^3 + \\
& 64*c^3) + (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^{1/2} + b^4 + 8*a^2*c^2 - 2*b^ \\
& 2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^3 + 16*a^4*c^2 \\
& + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 + 10*a*b^4*c)))^{1/ \\
& 2}*(64*a*b^3 + 128*a*c^3 + 128*a^3*c + 64*b^3*c - 32*b^4 - 32*a^2*b^2 + 256 \\
& *a^2*c^2 - 32*b^2*c^2 + \tan(x/2)*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^{1/2} + \\
& b^4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 3 \\
& 2*a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c \\
& ^2 + 10*a*b^4*c)))^{1/2}*(64*a*b^4 + 256*a*c^4 - 256*a^4*c - 64*b^4*c - 128 \\
& *a^2*b^3 + 64*a^3*b^2 + 256*a^2*c^3 - 256*a^3*c^2 - 64*b^2*c^3 + 128*b^3*c^ \\
& 2 + 192*a*b^2*c^2 - 192*a^2*b^2*c - 512*a*b*c^3 + 512*a^3*b*c) - 256*a*b*c^ \\
& 2 + 64*a*b^2*c - 256*a^2*b*c))*(-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^{1/2} + b^ \\
& 4 + 8*a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32* \\
& a^3*c^3 + 16*a^4*c^2 + b^4*c^2 - 8*a*b^2*c^3 - 8*a^3*b^2*c - 32*a^2*b^2*c^2 \\
& + 10*a*b^4*c)))^{1/2} - (\tan(x/2)*(32*a*b^2 - 64*a^2*c - 128*b*c^2 + 96*b^ \\
& 2*c - 32*b^3 + 64*c^3) - (-(8*a*c^3 - b*(-(4*a*c - b^2)^3)^{1/2} + b^4 + 8* \\
& a^2*c^2 - 2*b^2*c^2 - 6*a*b^2*c)/(2*(a^2*b^4 - b^6 + 16*a^2*c^4 + 32*a^3*c^ \\
\end{aligned}$$

$$\begin{aligned}
& \left( 3 + 16a^4c^2 + b^4c^2 - 8ab^2c^3 - 8a^3b^2c - 32a^2b^2c^2 + 10ab^4c \right)^{1/2} \left( 64ab^3 + 128a^2c^3 + 128a^3c + 64b^3c - 32b^4 - 32a^2b^2 + 256a^2c^2 - 32b^2c^2 - \tan(x/2) \left( -(8a^3c - b(-4ac - b^2)^3) \right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c \right) / \left( 2(a^2b^4 - b^6 + 16a^2c^4 + 32a^3c^3 + 16a^4c^2 + b^4c^2 - 8ab^2c^3 - 8a^3b^2c - 32a^2b^2c^2 + 10ab^4c) \right)^{1/2} \\
& \left( 64ab^4 + 256a^2c^4 - 256a^4c - 64b^4c - 128a^2b^3 + 64a^3b^2 + 256a^2c^3 - 256a^3c^2 - 64b^2c^3 + 128b^3c^2 + 192ab^2c^2 - 192a^2b^2c - 512abc^3 + 512a^3b^2c \right) - 256abc^2 + 64ab^2c - 256a^2b^2c \left( -(8a^3c - b(-4ac - b^2)^3) \right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c \right) / \left( 2(a^2b^4 - b^6 + 16a^2c^4 + 32a^3c^3 + 16a^4c^2 + b^4c^2 - 8ab^2c^3 - 8a^3b^2c - 32a^2b^2c^2 + 10ab^4c) \right)^{1/2} \left( -(8a^3c - b(-4ac - b^2)^3) \right)^{1/2} \\
& \left( -(8a^3c - b(-4ac - b^2)^3) \right)^{1/2} + b^4 + 8a^2c^2 - 2b^2c^2 - 6ab^2c \right) / \left( 2(a^2b^4 - b^6 + 16a^2c^4 + 32a^3c^3 + 16a^4c^2 + b^4c^2 - 8ab^2c^3 - 8a^3b^2c - 32a^2b^2c^2 + 10ab^4c) \right)^{1/2} * 2i
\end{aligned}$$

**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(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

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

[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}

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

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[ExpandTr
ig[cos[d + e*x]^m*(a + b*cos[d + e*x]^n + c*cos[d + e*x]^(2*n))^p, x], x] /
; FreeQ[{a, b, c, d, e}, x] && EqQ[n2, 2*n] && NeQ[b^2 - 4*a*c, 0] && Integ
ersQ[m, n, p]
```

### Rule 3293

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

### Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] := -Simp[ArcTanh[Cos[c + d*x]]/d, x]
/; FreeQ[{c, d}, x]
```

### Rubi steps

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

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

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

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 + 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]]) - Log[Cos[x/2] - Sin[x/2]] + Log[Cos[x/2] + Sin[x/2]]/a

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out

**maple** [B] time = 0.14, size = 1957, normalized size = 7.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

$+c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)} \cdot b^2+1/a/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctanh}((-a+b-c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)}) \cdot c^2+1/a/(-4*a*c+b^2)^{(1/2)}/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctan}((a-b+c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)}) \cdot b^3-2/a*b/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctanh}((-a+b-c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)}) \cdot c+1/a/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctanh}((-a+b-c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)}) \cdot b^2-1/a/(-4*a*c+b^2)^{(1/2)}/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctanh}((-a+b-c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)}) \cdot c-2/(-4*a*c+b^2)^{(1/2)}/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctanh}((-a+b-c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)}) \cdot c*a+2/(-4*a*c+b^2)^{(1/2)}/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctan}((a-b+c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)}) \cdot c*a+c/(-4*a*c+b^2)^{(1/2)}/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctanh}((-a+b-c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}-a+c) \cdot (a-b+c))^{(1/2)}) \cdot b-c/(-4*a*c+b^2)^{(1/2)}/(a-b+c) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)} \cdot \operatorname{arctan}((a-b+c) \cdot \tan(1/2*x) / (((-4*a*c+b^2)^{(1/2)}+a-c) \cdot (a-b+c))^{(1/2)}) \cdot b$

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

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

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

mupad [B] time = 13.55, size = 20126, normalized size = 82.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out]  $(2*\text{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 + (32768*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 + (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) - (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 + 131072*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$

$$\begin{aligned}
& 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 + (147456*c^5)/a - 360448*b^2*c^2 - (147456*b*c^4)/a + (49152*b^4*c)/a \\
& - (32768*b^5*c)/a^2 - (262144*b^2*c^3)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + (32768*b^3*c^3)/a^2 + (32768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131 \\
& 072*a*b^2*c) - (131072*a*b^2*c*\tan(x/2))/(655360*a*c^3 - 393216*b*c^3 + 131 \\
& 072*b^3*c + 16384*b^4 + 540672*c^4 - (16384*b^5)/a + 262144*a^2*c^2 + (1474 \\
& 56*c^5)/a - 360448*b^2*c^2 - (147456*b*c^4)/a + (49152*b^4*c)/a - (32768*b^ \\
& 5*c)/a^2 - (262144*b^2*c^3)/a + (229376*b^3*c^2)/a - (32768*b^2*c^4)/a^2 + \\
& (32768*b^3*c^3)/a^2 + (32768*b^4*c^2)/a^2 - 262144*a*b*c^2 - 131072*a*b^2*c \\
& ))/a - \operatorname{atan}\left(\frac{\left(\left(8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)\right)^{1/2}\right)}{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}\right. \\
& \left. + \frac{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}\right. \\
& \left. *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\right. \\
& \left.^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)\right)^{1/2} * (24576*a*c^5 - 49152*a*b^5 - 3 \\
& 2768*b^5*c + 24576*b^6 + 32768*a^2*b^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 25 \\
& 3952*a^3*c^3 + 98304*a^4*c^2 - 8192*b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 \\
& + (\tan(x/2)*(49152*a*b^6 - 65536*a^6*c + 16384*b^6*c - 16384*b^7 - 65536*a \\
& ^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 2 \\
& 12992*a^3*c^4 + 671744*a^4*c^3 + 245760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5 \\
& *c^2 + 98304*a*b^2*c^4 - 65536*a*b^3*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c \\
& ^4 - 393216*a^2*b^4*c - 1081344*a^3*b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b \\
& *c^2 - 327680*a^4*b^2*c + 344064*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 557056* \\
& a^3*b^2*c^2 + 98304*a*b^5*c + 196608*a^5*b*c) + \left(\frac{\left(8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)\right)^{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)\right)^{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)\right)^{1/2}}\right) * (57344*a^3*b^5 - 24576*a^2*b^6 - 40960*a^4*b^4 + 8192*a^5*b^3 - 98304*a^3*c^5 - 425984*a^4*c^4 - 557056*a^5*c^3 - 229376*a^6*c^2 + 49152*a^2*b^5*c + 196608*a^3*b*c^4 + 90112*a^3*b^4*c + 622592*a^4*b*c^3 - 327680*a^4*b^3*c + 393216*a^5*b*c^2 + 221184*a^5*b^2*c + \tan(x/2)*\left(\left(8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)\right)^{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)\right)^{1/2}}\right) * (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^4*c + 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) * \left(\frac{\left(8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)\right)^{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)\right)^{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)\right)^{1/2}}\right)
\end{aligned}$$

$$\begin{aligned}
& 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^2c^3 + 237568a^3b^3c^2 - 458752a^2b^3c^3 + 262144a^2b^3c - 270336a^3b^3c^2 - 155648a^3b^2c + 16384a^2b^2c^2 - 122880a^2b^3c^4 - 114688a^2b^4c^3 + 32768a^4b^3c + \tan(x/2)(8192a^4b^4 - 73728a^3c^4 - 57344b^3c^4 + 40960b^4c^3 - 8192b^5 + 24576c^5 - 81920a^2c^3 + 16384a^3c^2 + 81920b^2c^3 - 81920b^3c^2 - 81920a^2b^2c^2 + 81920a^2b^3c^2 - 32768a^2b^2c + 163840a^2b^3c^3) * ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{(1/2)} + b^4c^2 - 6a^2b^2c^3 + b^3c^2(-4ac - b^2)^3)^{(1/2)} - 18a^2b^2c^2 + 8a^2b^4c + 2a^2b^3c(-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)} * i - (((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{(1/2)} + b^4c^2 - 6a^2b^2c^3 + b^3c^2(-4ac - b^2)^3)^{(1/2)} - 18a^2b^2c^2 + 8a^2b^4c + 2a^2b^3c(-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^2c^5 - 49152a^2b^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)(49152a^2b^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 + 98304a^2b^2c^4 - 65536a^2b^3c^3 - 180224a^2b^4c^2 + 49152a^2b^3c^4 - 393216a^2b^4c - 1081344a^3b^3c^3 + 475136a^3b^3c - 802816a^4b^3c^2 - 327680a^4b^2c + 344064a^2b^2c^3 + 180224a^2b^3c^2 + 557056a^3b^2c^2 + 98304a^2b^5c + 196608a^5b^3c) + ((8a^2c^4 - b^6 + 8a^3c^3 - b^3(-4ac - b^2)^3)^{(1/2)} + b^4c^2 - 6a^2b^2c^3 + b^3c^2(-4ac - b^2)^3)^{(1/2)} - 18a^2b^2c^2 + 8a^2b^4c + 2a^2b^3c(-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^3c^4 - 90112a^3b^4c - 622592a^4b^3c^3 + 327680a^4b^3c - 393216a^5b^3c^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 - 6a^2b^2c^3 + b^3c^2(-4ac - b^2)^3)^{(1/2)} - 18a^2b^2c^2 + 8a^2b^4c + 2a^2b^3c(-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^3c^4 + 376832a^4b^4c + 720896a^5b^3c^3 - 409600a^5b^3c + 589824a^6b^3c^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^3c) - 24576a^2b^2c^4 + 49152a^2b^3c^3 - 106496a
\end{aligned}$$



$$\begin{aligned}
&^3b^2c^3 + 352256a^3b^3c^2 - 172032a^4b^2c^2 + 32768a^6b^3c) * ((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^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} + 24576a^2b^2c^3 + 237568a^3b^3c^2 - 458752a^2b^2c^3 + 262144a^2b^3c - 270336a^3b^2c^2 - 155648a^3b^2c + 16384a^2b^2c^2 - 122880a^3b^4c - 114688a^4b^4c + 32768a^4b^3c) - \tan(x/2) * (8192a^2b^4 - 73728a^3c^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) * ((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^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} * 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^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} * (24576a^5c^5 - 49152ab^5c - 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^3c) + ((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^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} * (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^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} * (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^3c - 409600a^5b^3c + 5898
\end{aligned}$$

$$\begin{aligned}
& 24*a^6*b*c^2 + 294912*a^6*b^2*c + 16384*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 1 \\
& 14688*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*a^3*b^4*c^2 - 557056*a^4*b^2 \\
& *c^3 + 16384*a^4*b^3*c^2 - 655360*a^5*b^2*c^2 - 196608*a^7*b*c) + 24576*a^2 \\
& *b^2*c^4 - 49152*a^2*b^3*c^3 + 106496*a^3*b^2*c^3 - 352256*a^3*b^3*c^2 + 17 \\
& 2032*a^4*b^2*c^2 - 32768*a^6*b*c)) * ((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4 \\
& *a*c - b^2)^3)^{(1/2)} + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} \\
& - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)}) / (2*(a^4 \\
& *b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^ \\
& 5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^{(1/2)} + 24576*a*b \\
& ^2*c^3 + 237568*a*b^3*c^2 - 458752*a^2*b*c^3 + 262144*a^2*b^3*c - 270336*a^ \\
& 3*b*c^2 - 155648*a^3*b^2*c + 16384*a^2*b^2*c^2 - 122880*a*b*c^4 - 114688*a* \\
& b^4*c + 32768*a^4*b*c) + \tan(x/2)*(8192*a*b^4 - 73728*a*c^4 - 57344*b*c^4 + \\
& 40960*b^4*c - 8192*b^5 + 24576*c^5 - 81920*a^2*c^3 + 16384*a^3*c^2 + 81920 \\
& *b^2*c^3 - 81920*b^3*c^2 - 81920*a*b^2*c^2 + 81920*a^2*b*c^2 - 32768*a^2*b^ \\
& 2*c + 163840*a*b*c^3)) * ((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^ \\
& 3)^{(1/2)} + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 18*a^2* \\
& b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)}) / (2*(a^4*b^4 - a^2*b \\
& ^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^ \\
& 2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^{(1/2)} + (((8*a^2*c^4 - b^6 + \\
& 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^{(1/2)} + b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(- \\
& (4*a*c - b^2)^3)^{(1/2)} - 18*a^2*b^2*c^2 + 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^ \\
& 2)^3)^{(1/2)}) / (2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + \\
& 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2) \\
& ))^{(1/2)} * (24576*a*c^5 - 49152*a*b^5 - 32768*b^5*c + 24576*b^6 + 32768*a^2*b \\
& ^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 253952*a^3*c^3 + 98304*a^4*c^2 - 8192* \\
& b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 - (\tan(x/2)*(49152*a*b^6 - 65536*a^ \\
& 6*c + 16384*b^6*c - 16384*b^7 - 65536*a^2*b^5 + 65536*a^3*b^4 - 49152*a^4*b \\
& ^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 212992*a^3*c^4 + 671744*a^4*c^3 + 245 \\
& 760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5*c^2 + 98304*a*b^2*c^4 - 65536*a*b^3 \\
& *c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c^4 - 393216*a^2*b^4*c - 1081344*a^3* \\
& b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a^4*b^2*c + 344064*a^2 \\
& *b^2*c^3 + 180224*a^2*b^3*c^2 + 557056*a^3*b^2*c^2 + 98304*a*b^5*c + 196608 \\
& *a^5*b*c) + ((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^{(1/2)} + \\
& b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 18*a^2*b^2*c^2 + 8 \\
& *a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)}) / (2*(a^4*b^4 - a^2*b^6 + 16*a^4 \\
& *c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - \\
& 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^{(1/2)} * (24576*a^2*b^6 - 57344*a^3*b^5 + 4 \\
& 0960*a^4*b^4 - 8192*a^5*b^3 + 98304*a^3*c^5 + 425984*a^4*c^4 + 557056*a^5*c \\
& ^3 + 229376*a^6*c^2 - 49152*a^2*b^5*c - 196608*a^3*b*c^4 - 90112*a^3*b^4*c \\
& - 622592*a^4*b*c^3 + 327680*a^4*b^3*c - 393216*a^5*b*c^2 - 221184*a^5*b^2*c \\
& + \tan(x/2)*((8*a^2*c^4 - b^6 + 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^{(1/2)} + \\
& b^4*c^2 - 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 18*a^2*b^2*c^2 + 8 \\
& *a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)}) / (2*(a^4*b^4 - a^2*b^6 + 16*a^4 \\
& *c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - \\
& 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^{(1/2)} * (65536*a^8*c + 16384*a^2*b^7 - 491
\end{aligned}$$

$$\begin{aligned}
& 52a^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 - 16384 \\
& *a^2b^6c - 114688a^3b^5c - 65536a^4b^4c + 376832a^4b^4c + 720896 \\
& *a^5b^4c^3 - 409600a^5b^3c + 589824a^6b^3c^2 + 294912a^6b^2c + 16384 \\
& *a^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^3c) - 24576a^2b^2c^4 + 49152a^2b^3c^3 - 106496a \\
& ^3b^2c^3 + 352256a^3b^3c^2 - 172032a^4b^2c^2 + 32768a^6b^3c)) * ((8 \\
& a^2c^4 - b^6 + 8a^3c^3 - b^3 * (-4ac - b^2)^3)^{1/2} + b^4c^2 - 6a^2b^ \\
& 2c^3 + b^2c^2 * (-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8a^2b^4c + 2a^2b \\
& *c * (-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^2c^3 + 237568a^2b^3c^2 - 458752a^2 \\
& b^3c^3 + 262144a^2b^3c - 270336a^3b^3c^2 - 155648a^3b^2c + 16384a^2 \\
& b^2c^2 - 122880a^2b^4c - 114688a^2b^4c + 32768a^4b^4c) - \tan(x/2) * (8192 \\
& *a^2b^4 - 73728a^2c^4 - 57344b^2c^4 + 40960b^4c - 8192b^5 + 24576c^5 - 8 \\
& 1920a^2c^3 + 16384a^3c^2 + 81920b^2c^3 - 81920b^3c^2 - 81920a^2b^2 \\
& c^2 + 81920a^2b^3c^2 - 32768a^2b^2c + 163840a^2b^3c) * ((8a^2c^4 - b^ \\
& 6 + 8a^3c^3 - b^3 * (-4ac - b^2)^3)^{1/2} + b^4c^2 - 6a^2b^2c^3 + b^2c^ \\
& 2 * (-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8a^2b^4c + 2a^2b^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^ \\
& c^2))^{1/2} - 49152a^2c^3 + 65536b^2c^3 - 49152c^4 - 16384b^2c^2 + 1638 \\
& 4a^2b^2c) * ((8a^2c^4 - b^6 + 8a^3c^3 - b^3 * (-4ac - b^2)^3)^{1/2} + \\
& b^4c^2 - 6a^2b^2c^3 + b^2c^2 * (-4ac - b^2)^3)^{1/2} - 18a^2b^2c^2 + 8 \\
& *a^2b^4c + 2a^2b^2c * (-4ac - b^2)^3)^{1/2}) / (2(a^4b^4 - a^2b^6 + 16a^4 \\
& *c^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} * 2i + \operatorname{atan}(-((\tan(x/2) * (8192a^2b^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 - 81920a^2b^2c^2 + 8 \\
& 1920a^2b^3c^2 - 32768a^2b^2c + 163840a^2b^3c) + (-(b^6 - 8a^2c^4 - 8 \\
& *a^3c^3 - b^3 * (-4ac - b^2)^3)^{1/2} - b^4c^2 + 6a^2b^2c^3 + b^2c^2 * (- \\
& 4ac - b^2)^3)^{1/2} + 18a^2b^2c^2 - 8a^2b^4c + 2a^2b^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} * (24576a^2c^5 - 49152a^2b^5 - 32768b^5c + 24576b^6 + (-(b^6 - 8 \\
& a^2c^4 - 8a^3c^3 - b^3 * (-4ac - b^2)^3)^{1/2} - b^4c^2 + 6a^2b^2c^3 \\
& + b^2c^2 * (-4ac - b^2)^3)^{1/2} + 18a^2b^2c^2 - 8a^2b^4c + 2a^2b^2c * (- \\
& 4ac - b^2)^3)^{1/2}) / (2(a^4b^4 - a^2b^6 + 16a^4c^4 + 32a^5c^3 + 16 \\
& *a^6c^2 + 10a^3b^4c - 8a^5b^2c + a^2b^4c^2 - 8a^3b^2c^3 - 32a^4 \\
& b^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^4c + 90112a^3b^4c + 622592a^4b^3c^3 - 3 \\
& 27680a^4b^3c + 393216a^5b^3c^2 + 221184a^5b^2c + 24576a^2b^2c^4 - \\
& 49152a^2b^3c^3 + 106496a^3b^2c^3 - 352256a^3b^3c^2 + 172032a^4b
\end{aligned}$$

$$\begin{aligned}
& ^2c^2 - 32768a^6bc + \tan(x/2)*(-(b^6 - 8a^2c^4 - 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 + 37 \\
& 6832a^4b^4c + 720896a^5b^3c - 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) + \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 - 1081 \\
& 344a^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)))*(-(b^6 - 8a^2c^4 - 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)} + 32768a^2b^4 - 8192a^3 \\
& b^3 + 180224a^2c^4 + 253952a^3c^3 + 98304a^4c^2 - 8192b^2c^4 + 32768b^3c^3 - 16384b^4c^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 + 32768a^4b^2c)))*(-(b^6 - 8a^2c^4 - 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)}*1i + (\tan(x/2)*(8192ab^4 - 73728a^2c^4 - 57344b^2c^4 + 4 \\
& 0960b^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) - (-(b^6 - 8a^2c^4 - 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^2c^5 - 49152a^2b^5 - 32768b^5c + 24576b^6 - ((-(b^6 - 8a^2c^4 - 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^
\end{aligned}$$



$$\begin{aligned}
& + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32 \\
& *a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^ \\
& 2*c^3 - 32*a^4*b^2*c^2)))^{(1/2)}*(24576*a^2*b^6 - 57344*a^3*b^5 + 40960*a^4* \\
& b^4 - 8192*a^5*b^3 + 98304*a^3*c^5 + 425984*a^4*c^4 + 557056*a^5*c^3 + 2293 \\
& 76*a^6*c^2 - 49152*a^2*b^5*c - 196608*a^3*b*c^4 - 90112*a^3*b^4*c - 622592* \\
& a^4*b*c^3 + 327680*a^4*b^3*c - 393216*a^5*b*c^2 - 221184*a^5*b^2*c - 24576* \\
& a^2*b^2*c^4 + 49152*a^2*b^3*c^3 - 106496*a^3*b^2*c^3 + 352256*a^3*b^3*c^2 - \\
& 172032*a^4*b^2*c^2 + 32768*a^6*b*c + \tan(x/2)*(-(b^6 - 8*a^2*c^4 - 8*a^3*c \\
& ^3 - b^3*(-(4*a*c - b^2)^3)^{(1/2)} - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c \\
& - b^2)^3)^{(1/2)} + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{( \\
& 1/2)}))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3 \\
& *b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^{(1/2} \\
& )*(65536*a^8*c + 16384*a^2*b^7 - 49152*a^3*b^6 + 65536*a^4*b^5 - 65536*a^5* \\
& b^4 + 49152*a^6*b^3 - 16384*a^7*b^2 + 196608*a^4*c^5 + 131072*a^5*c^4 - 262 \\
& 144*a^6*c^3 - 131072*a^7*c^2 - 16384*a^2*b^6*c - 114688*a^3*b^5*c - 65536*a \\
& ^4*b*c^4 + 376832*a^4*b^4*c + 720896*a^5*b*c^3 - 409600*a^5*b^3*c + 589824* \\
& a^6*b*c^2 + 294912*a^6*b^2*c + 16384*a^2*b^4*c^3 - 16384*a^2*b^5*c^2 - 1146 \\
& 88*a^3*b^2*c^4 + 81920*a^3*b^3*c^3 + 196608*a^3*b^4*c^2 - 557056*a^4*b^2*c^ \\
& 3 + 16384*a^4*b^3*c^2 - 655360*a^5*b^2*c^2 - 196608*a^7*b*c)) + \tan(x/2)*(4 \\
& 9152*a*b^6 - 65536*a^6*c + 16384*b^6*c - 16384*b^7 - 65536*a^2*b^5 + 65536* \\
& a^3*b^4 - 49152*a^4*b^3 + 16384*a^5*b^2 - 147456*a^2*c^5 + 212992*a^3*c^4 + \\
& 671744*a^4*c^3 + 245760*a^5*c^2 - 16384*b^4*c^3 + 16384*b^5*c^2 + 98304*a* \\
& b^2*c^4 - 65536*a*b^3*c^3 - 180224*a*b^4*c^2 + 49152*a^2*b*c^4 - 393216*a^2 \\
& *b^4*c - 1081344*a^3*b*c^3 + 475136*a^3*b^3*c - 802816*a^4*b*c^2 - 327680*a \\
& ^4*b^2*c + 344064*a^2*b^2*c^3 + 180224*a^2*b^3*c^2 + 557056*a^3*b^2*c^2 + 9 \\
& 8304*a*b^5*c + 196608*a^5*b*c)))*(-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a \\
& *c - b^2)^3)^{(1/2)} - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} \\
& + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)}))/(2*(a^4*b \\
& ^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5* \\
& b^2*c + a^2*b^4*c^2 - 8*a^3*b^2*c^3 - 32*a^4*b^2*c^2)))^{(1/2)} + 32768*a^2*b \\
& ^4 - 8192*a^3*b^3 + 180224*a^2*c^4 + 253952*a^3*c^3 + 98304*a^4*c^2 - 8192* \\
& b^2*c^4 + 32768*b^3*c^3 - 16384*b^4*c^2 + 24576*a*b^2*c^3 + 237568*a*b^3*c^ \\
& 2 - 458752*a^2*b*c^3 + 262144*a^2*b^3*c - 270336*a^3*b*c^2 - 155648*a^3*b^2 \\
& *c + 16384*a^2*b^2*c^2 - 122880*a*b*c^4 - 114688*a*b^4*c + 32768*a^4*b*c)) * \\
& (-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a*c - b^2)^3)^{(1/2)} - b^4*c^2 + 6 \\
& *a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 18*a^2*b^2*c^2 - 8*a*b^4*c + \\
& 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)}))/(2*(a^4*b^4 - a^2*b^6 + 16*a^4*c^4 + 32*a \\
& ^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*b^2*c + a^2*b^4*c^2 - 8*a^3*b^2* \\
& c^3 - 32*a^4*b^2*c^2)))^{(1/2)} - (\tan(x/2)*(8192*a*b^4 - 73728*a*c^4 - 57344 \\
& *b*c^4 + 40960*b^4*c - 8192*b^5 + 24576*c^5 - 81920*a^2*c^3 + 16384*a^3*c^2 \\
& + 81920*b^2*c^3 - 81920*b^3*c^2 - 81920*a*b^2*c^2 + 81920*a^2*b*c^2 - 3276 \\
& 8*a^2*b^2*c + 163840*a*b*c^3) + (-(b^6 - 8*a^2*c^4 - 8*a^3*c^3 - b^3*(-(4*a \\
& *c - b^2)^3)^{(1/2)} - b^4*c^2 + 6*a*b^2*c^3 + b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} \\
& + 18*a^2*b^2*c^2 - 8*a*b^4*c + 2*a*b*c*(-(4*a*c - b^2)^3)^{(1/2)}))/(2*(a^4*b \\
& ^4 - a^2*b^6 + 16*a^4*c^4 + 32*a^5*c^3 + 16*a^6*c^2 + 10*a^3*b^4*c - 8*a^5*
\end{aligned}$$



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

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

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\_)]^(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 3770

Int[csc[(c\_.) + (d\_.)\*(x\_)], x\_Symbol] := -Simp[ArcTanh[Cos[c + d\*x]]/d, x] /; FreeQ[{c, d}, x]

### Rubi steps

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

**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]  $\left( -\left( \left( \sqrt{2} c \left( b \sqrt{b^2 - 4ac} + 2ac - b^2 \right) \text{ArcTanh}\left[ \frac{\tan\left(\frac{x}{2}\right) \left( \sqrt{b^2 - 4ac} + b - 2c \right)}{\sqrt{-2b \sqrt{b^2 - 4ac} + 4c(a+c) - 2b^2}} \right] \right) / \left( \sqrt{b^2 - 4ac} \sqrt{-b \sqrt{b^2 - 4ac} + 2c(a+c) - b^2} \right) \right) + \left( \sqrt{2} c \left( b \sqrt{b^2 - 4ac} - 2ac + b^2 \right) \text{ArcTanh}\left[ \frac{\tan\left(\frac{x}{2}\right) \left( \sqrt{b^2 - 4ac} - b + 2c \right)}{\sqrt{2b \sqrt{b^2 - 4ac} + 4c(a+c) - 2b^2}} \right] \right) / \left( \sqrt{b^2 - 4ac} \sqrt{b \sqrt{b^2 - 4ac} + 2c(a+c) - b^2} \right) \right) + b \text{Log}\left[ \frac{\cos\left(\frac{x}{2}\right) - \sin\left(\frac{x}{2}\right)}{\cos\left(\frac{x}{2}\right) + \sin\left(\frac{x}{2}\right)} \right] + \frac{a \sin\left(\frac{x}{2}\right)}{\cos\left(\frac{x}{2}\right) - \sin\left(\frac{x}{2}\right)} \right) / a^2$

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

Timed out



$$\begin{aligned}
& +c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*c*b^2-2/a^2/(-4*a*c+b^2)^{(1/2)}/(a-b+c) \\
& )/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*c*b^3+2/a^2/(-4*a*c+b^2)^{(1/2)}/(a-b+c) \\
& )/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*c*b^3+1/a^2/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/ \\
& ((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*c^2*b^2-1/a^2/(-4*a*c+b^2)^{(1/2)}/(a-b+c) \\
& )/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*c^2*b^2-2/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/(( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*c^2+2/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*c^2-1/a^2/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*b^3-1/a^2/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*b^3+1/a/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*b^2-1/a/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*c^2-1/a/(tan(1/2*x)-1)-1/a/(tan(1/2*x)+1)+1/a/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*b^3+1/a/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*b^2-1/a/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*b^3+3*c/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*b-3*c/(-4*a*c+b^2)^{(1/2)}/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*b+2/a^2/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*\arctanh((-a+b-c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}-a+c)*(a-b+c))^{(1/2)}*c*b^2-1/a^2/(a-b+c)/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*\arctan((a-b+c)*\tan(1/2*x))/((( -4*a*c+b^2)^{(1/2)}+a-c)*(a-b+c))^{(1/2)}*c^2*b
\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] 1/2\*(2\*(a^2\*cos(2\*x)^2 + a^2\*sin(2\*x)^2 + 2\*a^2\*cos(2\*x) + a^2)\*integrate(2\*(2\*b^2\*c\*cos(3\*x)^2 + 2\*b^2\*c\*cos(x)^2 + 2\*b^2\*c\*sin(3\*x)^2 + 2\*b^2\*c\*sin(x)^2 + b\*c^2\*cos(x) + 4\*(2\*a\*b^2 - a\*c^2 - (2\*a^2 - b^2)\*c)\*cos(2\*x)^2 + 4\*

$$\begin{aligned} & (2*a*b^2 - a*c^2 - (2*a^2 - b^2)*c)*\sin(2*x)^2 + 2*(2*b^3 + b*c^2)*\sin(2*x) \\ & * \sin(x) + (b*c^2*\cos(3*x) + b*c^2*\cos(x) + 2*(b^2*c - a*c^2)*\cos(2*x))*\cos( \\ & 4*x) + (4*b^2*c*\cos(x) + b*c^2 + 2*(2*b^3 + b*c^2)*\cos(2*x))*\cos(3*x) + 2*( \\ & b^2*c - a*c^2 + (2*b^3 + b*c^2)*\cos(x))*\cos(2*x) + (b*c^2*\sin(3*x) + b*c^2* \\ & \sin(x) + 2*(b^2*c - a*c^2)*\sin(2*x))*\sin(4*x) + 2*(2*b^2*c*\sin(x) + (2*b^3 \\ & + b*c^2)*\sin(2*x))*\sin(3*x))/(a^2*c^2*\cos(4*x)^2 + 4*a^2*b^2*\cos(3*x)^2 + 4 \\ & *a^2*b^2*\cos(x)^2 + a^2*c^2*\sin(4*x)^2 + 4*a^2*b^2*\sin(3*x)^2 + 4*a^2*b^2*s \\ & \sin(x)^2 + 4*a^2*b*c*\cos(x) + a^2*c^2 + 4*(4*a^4 + 4*a^3*c + a^2*c^2)*\cos(2* \\ & x)^2 + 4*(4*a^4 + 4*a^3*c + a^2*c^2)*\sin(2*x)^2 + 8*(2*a^3*b + a^2*b*c)*\sin \\ & (2*x)*\sin(x) + 2*(2*a^2*b*c*\cos(3*x) + 2*a^2*b*c*\cos(x) + a^2*c^2 + 2*(2*a^ \\ & 3*c + a^2*c^2)*\cos(2*x))*\cos(4*x) + 4*(2*a^2*b^2*\cos(x) + a^2*b*c + 2*(2*a^ \\ & 3*b + a^2*b*c)*\cos(2*x))*\cos(3*x) + 4*(2*a^3*c + a^2*c^2 + 2*(2*a^3*b + a^2 \\ & *b*c)*\cos(x))*\cos(2*x) + 4*(a^2*b*c*\sin(3*x) + a^2*b*c*\sin(x) + (2*a^3*c + \\ & a^2*c^2)*\sin(2*x))*\sin(4*x) + 8*(a^2*b^2*\sin(x) + (2*a^3*b + a^2*b*c)*\sin(2 \\ & *x))*\sin(3*x)), x - (b*\cos(2*x)^2 + b*\sin(2*x)^2 + 2*b*\cos(2*x) + b)*\log(c \\ & \cos(x)^2 + \sin(x)^2 + 2*\sin(x) + 1) + (b*\cos(2*x)^2 + b*\sin(2*x)^2 + 2*b*\cos \\ & (2*x) + b)*\log(\cos(x)^2 + \sin(x)^2 - 2*\sin(x) + 1) + 4*a*\sin(2*x))/(a^2*\cos \\ & (2*x)^2 + a^2*\sin(2*x)^2 + 2*a^2*\cos(2*x) + a^2) \end{aligned}$$

**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]  $(b*\text{atan}(((b*((8192*\tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c)))/a^4 + (b*((8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c)))/a^4 + (b*((b*((8192*(3*a^5*b^7 - 7*a^6*b^6 + 5*a^7*b^5 - a^8*b^4 + 12*a^7*c^5 + 20*a^8*c^4 + 4*a^9*c^3 - 4*a^10*c^2 - 5*a^5*b^6*c + 8*a^6*b*c^5 - 15*a^6*b^5*c + 28*a^7*b*c^4 + 46*a^7*b^4*c + 64*a^8*b*c^3 - 31*a^8*b^3*c + 44*a^9*b*c^2 + 5*a^9*b^2*c - 2*a^5*b^3*c^4 + 5*a^5*b^4*c^3 - a^5*b^5*c^2 - 23*a^6*b^2*c^4 - 3*a^6*b^3*c^3 + 40*a^6*b^4*c^2 - 85*a^7*b^2*c^3 - 4*a^7*b^3*c^2 - 73*a^8*b^2*c^2)))/a^4 + (8192*b*\tan(x/2)*(8*a^12*c + 2*a^6*b^7 - 6*a^7*b^6 + 8*a^8*b^5 - 8*a^9*b^4 + 6*a^10*b^3 - 2*a^11*b^2 + 24*a^8*c^5 + 16*a^9*c^4 - 32*a^10*c^3 - 16*a^11*c^2 - 2*a^6*b^6*c - 14*$

$$\begin{aligned}
& a^7 b^5 c - 8 a^8 b^4 c^2 + 46 a^8 b^4 c^3 + 88 a^9 b^3 c^3 - 50 a^9 b^3 c^4 + 72 a^{10} b^2 c^2 + 36 a^{10} b^2 c^3 + 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^3 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^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) * i) / a^2 \\
& + (b((8192 \tan(x/2) (a^8 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^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^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((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^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 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^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^3 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^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) * i) / a^2) / ((16384 (b^7 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^3 c^6) / a^4 + (b((8192 \tan(x/2) (a^8 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
\end{aligned}$$

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



$$\begin{aligned}
& 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 + 8 \\
& 8 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^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^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}(((((((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 \\
& 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^2 c^2 * (- (4 a c - b^2)^3)^{1/2} - \\
& 2 a b^3 c^3 * (- (4 a c - b^2)^3)^{1/2} + 4 a b^3 c^3 * (- (4 a c - b^2)^3)^{1/2} \\
& 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^2 c^2 * (- (4 a c - b^2)^3)^{1/2} - 2 a b^3 c^3 * (- (4 a c - b^2)^3)^{1/2} + \\
& 4 a b^3 c^3 * (- (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 \\
& ^5 + 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} -
\end{aligned}$$

$$\begin{aligned}
& 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 2*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)}/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2))^{(1/2)} + (8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c))/a^4) * (-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 2*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2))^{(1/2)} - (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4) * (-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 - b^5*(-(4*a*c - b^2)^3)^{(1/2)} - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 + b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a*b^6*c - 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 2*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)})/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2))^{(1/2)} * i - (((((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 +
\end{aligned}$$

$$\begin{aligned}
& 33a^2b^4c^2 - 38a^3b^2c^3 + b^3c^2(-4ac - b^2)^3)^{(1/2)} - 10a^* \\
& b^6c - 3a^2b^*c^2(-4ac - b^2)^3)^{(1/2)} - 2a^*b^*c^3(-4ac - b^2)^3)^{(1/2)} + 4a^*b^3c^* \\
& (-4ac - b^2)^3)^{(1/2)) / (2(a^6b^4 - a^4b^6 + 16a^6 \\
& *c^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^6* \\
& c^5 - 2a^7c^4 + 2a^8c^3 + 2a^2b^8c + 14a^3b^7c - 50a^4b^6c - 2 \\
& 2a^5b^*c^5 + 56a^5b^5c + 12a^6b^*c^4 - 38a^6b^4c + 18a^7b^*c^3 + 2 \\
& 4a^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^3 \\
& *c^5 + 8a^4c^4 - b^5(-4ac - b^2)^3)^{(1/2)} - b^6c^2 + 8a^*b^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^*b^6c - 3a^2b^* \\
& c^2(-4ac - b^2)^3)^{(1/2)} - 2a^*b^*c^3(-4ac - b^2)^3)^{(1/2)} + 4a^*b^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 \\
& - 3a^*b^9 - 4a^3b^7 + a^4b^6 + 3a^4c^6 + 2a^5c^5 - a^6c^4 + 2a^*b^5 \\
& *c^4 - 5a^*b^6c^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^3 \\
& *b^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^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(-4ac - b^2)^3)^{(1/2)} - 10a^*b^6c - 3a^2b^*c^2(-4ac - b^2)^3)^{(1/2)} - 2a^*b^*c^3(-4ac - b^2)^3)^{(1/2)} + 4a^*b^3c^* \\
& (-4ac - b^2)^3)^{(1/2)) / (2(a^6b^4 - a^4b^6 + 16a^6c^4 + 32a^7c^3 + 16a^8c^2 + 10 \\
& *a^5b^4c - 8a^7b^2c + a^4b^4c^2 - 8a^5b^2c^3 - 32a^6b^2c^2))^{(1/2)} + (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 - 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^4b^2c^3 + 2a^*b^7c)) / 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(-4ac - b^2)^3)^{(1/2)} - 10a^*b^6c - 3a^2b^*c^2(-4ac - b^2)^3)^{(1/2)} - 2a^*b^*c^3(-4ac - b^2)^3)^{(1/2)} + 4a^*b^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 + 4 \\
& *a^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^6*
\end{aligned}$$

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

$$\begin{aligned}
& + b^4c^5 - 5b^5c^4 + 10b^6c^3 - 10b^7c^2 - 2ab^2c^6 + 14a^2b^3c^5 \\
& - 35a^2b^4c^4 + 40a^2b^5c^3 - 20a^2b^6c^2 - a^2b^7c - 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^4b^2c^3 + 2a^4b^7c) / a^4 * \\
& (- (b^8 + 8a^3c^5 + 8a^4c^4 - b^5 * (- (4ac - b^2)^3)^{1/2} - b^6c^2 + 8 \\
& ab^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 * (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 + 28 \\
& a^7b^4c + 46a^7b^4c + 64a^8b^3c - 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 \\
& - 50a^9b^3c + 72a^{10}b^2c + 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 + 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
\end{aligned}$$

$$\begin{aligned}
& - 8a^7b^2c + a^4b^4c^2 - 8a^5b^2c^3 - 32a^6b^2c^2))^{(1/2)} + (8192(6a^2b^8 - 3a^3b^9 - 4a^3b^7 + a^4b^6 + 3a^4c^6 + 2a^5c^5 - a^6c^4 + 2a^5b^5c^4 - 5a^5b^6c^3 + a^5b^7c^2 + 16a^2b^7c + 8a^3b^5c^6 - 38a^3b^6c + 10a^4b^5c^5 + 23a^4b^5c + 6a^5b^5c^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 + 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^5b^8c)) / a^4) * (- (b^8 + 8a^3c^5 + 8a^4c^4 - b^5 * (- (4ac - b^2)^3)^{(1/2)} - b^6c^2 + 8a^5b^4c^3 - 18a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + b^3c^2 * (- (4ac - b^2)^3)^{(1/2)} - 10a^5b^6c - 3a^2b^5c^2 * (- (4ac - b^2)^3)^{(1/2)} - 2a^5b^3c^3 * (- (4ac - b^2)^3)^{(1/2)} + 4a^5b^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) * (a^5b^8 + 5b^8c - b^9 + a^2c^7 + a^3c^6 + b^4c^5 - 5b^5c^4 + 10b^6c^3 - 10b^7c^2 - 2a^5b^2c^6 + 14a^5b^3c^5 - 35a^5b^4c^4 + 40a^5b^5c^3 - 20a^5b^6c^2 - a^2b^5c^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^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 + 8a^5b^4c^3 - 18a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + b^3c^2 * (- (4ac - b^2)^3)^{(1/2)} - 10a^5b^6c - 3a^2b^5c^2 * (- (4ac - b^2)^3)^{(1/2)} - 2a^5b^3c^3 * (- (4ac - b^2)^3)^{(1/2)} + 4a^5b^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)} + (16384 * (b^7c^7 - 4b^2c^6 + 6b^3c^5 - 4b^4c^4 + b^5c^3 - 2a^5b^2c^5 + 2a^5b^3c^4 - a^5b^4c^3 + a^2b^2c^4 + a^5b^6c)) / a^4) * (- (b^8 + 8a^3c^5 + 8a^4c^4 - b^5 * (- (4ac - b^2)^3)^{(1/2)} - b^6c^2 + 8a^5b^4c^3 - 18a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 + b^3c^2 * (- (4ac - b^2)^3)^{(1/2)} - 10a^5b^6c - 3a^2b^5c^2 * (- (4ac - b^2)^3)^{(1/2)} - 2a^5b^3c^3 * (- (4ac - b^2)^3)^{(1/2)} + 4a^5b^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)} * 2i - \operatorname{atan}(((((((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^5c^4 + 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 + 8a^5b^4c^3 - 18a^2b^2c^4 + 33a^2b^4c^2 - 38a^3b^2c^3 - b^3c^2 * (- (4ac - b^2)^3)^{(1/2)} - 10a^5b^6c + 3a^2b^5c^2 * (- (4ac - b^2)^3)^{(1/2)} + 2a^5b^3c^3 * (- (4ac - b^2)^3)^{(1/2)} - 4a^5b^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}
\end{aligned}$$

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

$$\begin{aligned}
& - 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)}*i - \\
& (((((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^2 + 28*a^7*b^4*c^3 + 46*a^8*b^3*c^2 + 64*a^9*b^2*c^2 + 5*a^10*b^2*c^2 - 2*a^5*b^3*c^4 + 5*a^6*b^2*c^3 - a^5*b^4*c^3 - 23*a^6*b^3*c^3 + 40*a^7*b^2*c^2 - 85*a^8*b^2*c^2 - 4*a^9*b^2*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 -
\end{aligned}$$





$$\begin{aligned}
& 2*c^2))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^{(1/2)} \\
& - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 \\
& - b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 2*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} - 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2)) \\
& )^{(1/2)} + (8192*(6*a^2*b^8 - 3*a*b^9 - 4*a^3*b^7 + a^4*b^6 + 3*a^4*c^6 + 2*a^5*c^5 - a^6*c^4 + 2*a*b^5*c^4 - 5*a*b^6*c^3 + a*b^7*c^2 + 16*a^2*b^7*c + 8*a^3*b*c^6 - 38*a^3*b^6*c + 10*a^4*b*c^5 + 23*a^4*b^5*c + 6*a^5*b*c^4 - 5*a^5*b^4*c - 10*a^2*b^3*c^5 + 25*a^2*b^4*c^4 + 4*a^2*b^5*c^3 - 41*a^2*b^6*c^2 - 20*a^3*b^2*c^5 - 36*a^3*b^3*c^4 + 91*a^3*b^4*c^3 - 3*a^3*b^5*c^2 - 24*a^4*b^2*c^4 - 55*a^4*b^3*c^3 + 57*a^4*b^4*c^2 - 3*a^5*b^2*c^3 - 28*a^5*b^3*c^2 + 4*a^6*b^2*c^2 + 5*a*b^8*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^{(1/2)} - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 2*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} - 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2))^{(1/2)} - (8192*tan(x/2)*(a*b^8 + 5*b^8*c - b^9 + a^2*c^7 + a^3*c^6 + b^4*c^5 - 5*b^5*c^4 + 10*b^6*c^3 - 10*b^7*c^2 - 2*a*b^2*c^6 + 14*a*b^3*c^5 - 35*a*b^4*c^4 + 40*a*b^5*c^3 - 20*a*b^6*c^2 - a^2*b*c^6 - 6*a^2*b^6*c + 10*a^2*b^2*c^5 - 20*a^2*b^3*c^4 + 5*a^2*b^4*c^3 + 11*a^2*b^5*c^2 + 10*a^3*b^2*c^4 - 18*a^3*b^3*c^3 + 9*a^3*b^4*c^2 - 2*a^4*b^2*c^3 + 2*a*b^7*c))/a^4)*(-(b^8 + 8*a^3*c^5 + 8*a^4*c^4 + b^5*(-(4*a*c - b^2)^3)^{(1/2)} - b^6*c^2 + 8*a*b^4*c^3 - 18*a^2*b^2*c^4 + 33*a^2*b^4*c^2 - 38*a^3*b^2*c^3 - b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a*b^6*c + 3*a^2*b*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 2*a*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} - 4*a*b^3*c*(-(4*a*c - b^2)^3)^{(1/2)))/(2*(a^6*b^4 - a^4*b^6 + 16*a^6*c^4 + 32*a^7*c^3 + 16*a^8*c^2 + 10*a^5*b^4*c - 8*a^7*b^2*c + a^4*b^4*c^2 - 8*a^5*b^2*c^3 - 32*a^6*b^2*c^2))^{(1/2)} + (((((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*
\end{aligned}$$

$$\begin{aligned}
& b^4c^2 - 68a^8b^2c^3 + 2a^8b^3c^2 - 80a^9b^2c^2 - 24a^{11}bc) / a^4 \\
& \cdot (- (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 \\
& \cdot (- (4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2 \cdot (- (4ac - b^2)^3)^{1/2} \\
& + 2ab^3c^3 \cdot (- (4ac - b^2)^3)^{1/2} - 4ab^3c \cdot (- (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) \cdot (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^2 \\
& - 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^4 \\
& \cdot 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 + 23a^7 \\
& \cdot b^2c^2)) / a^4 \cdot (- (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 \\
& \cdot c^3 - b^3c^2 \cdot (- (4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2 \cdot (- (4ac \\
& - b^2)^3)^{1/2} + 2ab^3c^3 \cdot (- (4ac - b^2)^3)^{1/2} - 4ab^3c \cdot (- (4ac \\
& - b^2)^3)^{1/2})) / (2(a^6b^4 - a^4b^6 + 16a^6c^4 + 32a^7c^3 + 16a^8 \\
& \cdot c^2 + 10a^5b^4c - 8a^7b^2c + a^4b^4c^2 - 8a^5b^2c^3 - 32a^6b^2 \\
& \cdot c^2))^{1/2} + (8192 \cdot (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^7 \\
& \cdot c + 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^6 \\
& \cdot c^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 \\
& \cdot b^3c^2 + 4a^6b^2c^2 + 5ab^8c)) / a^4 \cdot (- (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 \\
& \cdot 3a^2b^4c^2 - 38a^3b^2c^3 - b^3c^2 \cdot (- (4ac - b^2)^3)^{1/2} - 10ab^6 \\
& \cdot c + 3a^2b^2c^2 \cdot (- (4ac - b^2)^3)^{1/2} + 2ab^3c^3 \cdot (- (4ac - b^2)^3)^{1/2} \\
& - 4ab^3c \cdot (- (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 - 8 \\
& \cdot a^5b^2c^3 - 32a^6b^2c^2))^{1/2} + (8192 \tan(x/2) \cdot (ab^8 + 5b^8c - \\
& b^9 + a^2c^7 + a^3c^6 + b^4c^5 - 5b^5c^4 + 10b^6c^3 - 10b^7c^2 - 2 \\
& \cdot ab^2c^6 + 14ab^3c^5 - 35ab^4c^4 + 40ab^5c^3 - 20ab^6c^2 - a^2 \\
& \cdot b^2c^6 - 6a^2b^6c + 10a^2b^2c^5 - 20a^2b^3c^4 + 5a^2b^4c^3 + 1 \\
& \cdot 1a^2b^5c^2 + 10a^3b^2c^4 - 18a^3b^3c^3 + 9a^3b^4c^2 - 2a^4b^2 \\
& \cdot c^3 + 2ab^7c)) / a^4 \cdot (- (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^3 \\
& \cdot b^2c^3 - b^3c^2 \cdot (- (4ac - b^2)^3)^{1/2} - 10ab^6c + 3a^2b^2c^2 \cdot (- \\
& (4ac - b^2)^3)^{1/2} + 2ab^3c^3 \cdot (- (4ac - b^2)^3)^{1/2} - 4ab^3c \cdot (- ( \\
& 4ac - b^2)^3)^{1/2})) / (2(a^6b^4 - a^4b^6 + 16a^6c^4 + 32a^7c^3 + 16 \\
& \cdot a^8c^2 + 10a^5b^4c - 8a^7b^2c + a^4b^4c^2 - 8a^5b^2c^3 - 32a^6 \\
& \cdot b^2c^2))^{1/2} + (16384 \cdot (b^7c - 4b^2c^6 + 6b^3c^5 - 4b^4c^4 + b^5 \\
& \cdot c^3 - 2ab^2c^5 + 2ab^3c^4 - ab^4c^3 + a^2b^2c^4 + abc^6)) / a^4
\end{aligned}$$

```

))*(-(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

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

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

**Rubi [A]** time = 4.67, antiderivative size = 334, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 19,  $\frac{\text{number of rules}}{\text{integrand size}} = 0.421$ , Rules used = {3257, 3293, 2659, 205, 3770, 3767, 8, 3768}

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

Antiderivative was successfully verified.

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

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

Rule 8

Int[a\_, x\_Symbol] := Simp[a\*x, x] /; FreeQ[a, x]

Rule 205

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

Rule 2659

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

Rule 3257

```
Int[cos[(d_) + (e_)*(x_)]^(m_)*((a_) + cos[(d_) + (e_)*(x_)]^(n_)*(b_) + cos[(d_) + (e_)*(x_)]^(n2_)*(c_))^(p_), x_Symbol] := Int[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

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

**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] 
$$\begin{aligned}
& -1/4 * ((4 * \text{Sqrt}[2] * c * (b^3 - 3 * a * b * c - b^2 * \text{Sqrt}[b^2 - 4 * a * c]) + a * c * \text{Sqrt}[b^2 - 4 * a * c]) * \text{ArcTanh}[\frac{(b - 2 * c + \text{Sqrt}[b^2 - 4 * a * c]) * \text{Tan}[x/2]}{\text{Sqrt}[-2 * b^2 + 4 * c * (a + c) - 2 * b * \text{Sqrt}[b^2 - 4 * a * c]]}] / (\text{Sqrt}[b^2 - 4 * a * c] * \text{Sqrt}[-b^2 + 2 * c * (a + c) - b * \text{Sqrt}[b^2 - 4 * a * c]]) + (4 * \text{Sqrt}[2] * c * (b^3 - 3 * a * b * c + b^2 * \text{Sqrt}[b^2 - 4 * a * c]) - a * c * \text{Sqrt}[b^2 - 4 * a * c]) * \text{ArcTanh}[\frac{(-b + 2 * c + \text{Sqrt}[b^2 - 4 * a * c]) * \text{Tan}[x/2]}{\text{Sqrt}[-2 * b^2 + 4 * c * (a + c) + 2 * b * \text{Sqrt}[b^2 - 4 * a * c]]}] / (\text{Sqrt}[b^2 - 4 * a * c] * \text{Sqrt}[-b^2 + 2 * c * (a + c) + b * \text{Sqrt}[b^2 - 4 * a * c]]) + 2 * (a^2 + 2 * b^2 - 2 * a * c)
\end{aligned}$$

) \* Log[Cos[x/2] - Sin[x/2]] - 2\*(a^2 + 2\*b^2 - 2\*a\*c) \* Log[Cos[x/2] + Sin[x/2]] + (4\*a\*b\*Sin[x/2]) / (Cos[x/2] - Sin[x/2]) + a^2 / (Cos[x/2] + Sin[x/2])^2 + (4\*a\*b\*Sin[x/2]) / (Cos[x/2] + Sin[x/2]) + a^2 / (-1 + Sin[x]) / a^3

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out

**maple** [B] time = 0.16, size = 3476, normalized size = 10.41

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 
$$\frac{1}{a^3(a-b+c)} \left( \frac{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2} \arctan((a-b+c)\tan(1/2x))}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}} + \frac{c^2b^2-2/a^3(a-b+c)}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}} + \frac{c^2b^3+1/a^3(-4ac+b^2)^{1/2}}{(a-b+c)} + \frac{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2} \arctan((a-b+c)\tan(1/2x))}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}} + \frac{b^5+1/a^3(a-b+c)}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}} + \frac{c^2b^2-2/a^3(a-b+c)}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}} + \frac{c^2b^3-1/a^3}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}} + \frac{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2} \operatorname{arctanh}((-a+b-c)\tan(1/2x))}{((-4ac+b^2)^{1/2}-a+c)(a-b+c)^{1/2}} + \frac{b^5+1/a^2}{\tan(1/2x)-1} + \frac{b+1/a^2 \ln(\tan(1/2x)-1)c-1/a^3 \ln(\tan(1/2x)-1)b^2+1/a^2}{\tan(1/2x)+1} + \frac{b-1/a^2 \ln(\tan(1/2x)+1)c+1/a^3 \ln(\tan(1/2x)+1)b^2+1/2/a}{\tan(1/2x)-1} - \frac{1/2/a}{\tan(1/2x)+1} - \frac{1/a^2}{(a-b+c)} \right) \frac{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2} \arctan((a-b+c)\tan(1/2x))}{((-4ac+b^2)^{1/2}+a-c)(a-b+c)^{1/2}}$$



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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] 
$$-1/4*(8*a^2*\cos(3*x)*\sin(2*x) + 8*a^2*\cos(2*x)*\sin(x) + 4*a^2*\sin(x) - 4*(a^2*\sin(3*x) + 2*a*b*\sin(2*x) - a^2*\sin(x))*\cos(4*x) - 4*(a^3*\cos(4*x)^2 + 4*a^3*\cos(2*x)^2 + a^3*\sin(4*x)^2 + 4*a^3*\sin(4*x)*\sin(2*x) + 4*a^3*\sin(2*x)^2 + 4*a^3*\cos(2*x) + a^3 + 2*(2*a^3*\cos(2*x) + a^3)*\cos(4*x))*\operatorname{integrate}(-2*(2*(b^3*c - a*b*c^2)*\cos(3*x)^2 + 4*(2*a*b^3 - 2*a*b*c^2 - (4*a^2*b - b^3)*c)*\cos(2*x)^2 + 2*(b^3*c - a*b*c^2)*\cos(x)^2 + 2*(b^3*c - a*b*c^2)*\sin(3*x)^2 + 4*(2*a*b^3 - 2*a*b*c^2 - (4*a^2*b - b^3)*c)*\sin(2*x)^2 + 2*(2*b^4 - 2*a*b^2*c - a*c^3 - (2*a^2 - b^2)*c^2)*\sin(2*x)*\sin(x) + 2*(b^3*c - a*b*c^2)*\sin(x)^2 + ((b^2*c^2 - a*c^3)*\cos(3*x) + 2*(b^3*c - 2*a*b*c^2)*\cos(2*x) + (b^2*c^2 - a*c^3)*\cos(x))*\cos(4*x) + (b^2*c^2 - a*c^3 + 2*(2*b^4 - 2*a*b^2*c - a*c^3 - (2*a^2 - b^2)*c^2)*\cos(2*x) + 4*(b^3*c - a*b*c^2)*\cos(x))*\cos(3*x) + 2*(b^3*c - 2*a*b*c^2 + (2*b^4 - 2*a*b^2*c - a*c^3 - (2*a^2 - b^2)*c^2))*\cos(x))*\cos(2*x) + (b^2*c^2 - a*c^3)*\cos(x) + ((b^2*c^2 - a*c^3)*\sin(3*x) + 2*(b^3*c - 2*a*b*c^2)*\sin(2*x) + (b^2*c^2 - a*c^3)*\sin(x))*\sin(4*x) + 2*((2*b^4 - 2*a*b^2*c - a*c^3 - (2*a^2 - b^2)*c^2)*\sin(2*x) + 2*(b^3*c - a*b*c^2)*\sin(x))*\sin(3*x))/(a^3*c^2*\cos(4*x)^2 + 4*a^3*b^2*\cos(3*x)^2 + 4*a^3*b^2*\cos(x)^2 + a^3*c^2*\sin(4*x)^2 + 4*a^3*b^2*\sin(3*x)^2 + 4*a^3*b^2*\sin(x)^2 + 4*a^3*b*c*\cos(x) + a^3*c^2 + 4*(4*a^5 + 4*a^4*c + a^3*c^2)*\cos(2*x)^2 + 4*(4*a^5 + 4*a^4*c + a^3*c^2)*\sin(2*x)^2 + 8*(2*a^4*b + a^3*b*c)*\sin(2*x)*$$

```

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))*s
in(3*x)), x) - ((a^2 + 2*b^2 - 2*a*c)*cos(4*x)^2 + 4*(a^2 + 2*b^2 - 2*a*c)*
cos(2*x)^2 + (a^2 + 2*b^2 - 2*a*c)*sin(4*x)^2 + 4*(a^2 + 2*b^2 - 2*a*c)*sin
(4*x)*sin(2*x) + 4*(a^2 + 2*b^2 - 2*a*c)*sin(2*x)^2 + a^2 + 2*b^2 - 2*a*c +
2*(a^2 + 2*b^2 - 2*a*c + 2*(a^2 + 2*b^2 - 2*a*c)*cos(2*x))*cos(4*x) + 4*(a
^2 + 2*b^2 - 2*a*c)*cos(2*x))*log(cos(x)^2 + sin(x)^2 + 2*sin(x) + 1) + ((a
^2 + 2*b^2 - 2*a*c)*cos(4*x)^2 + 4*(a^2 + 2*b^2 - 2*a*c)*cos(2*x)^2 + (a^2
+ 2*b^2 - 2*a*c)*sin(4*x)^2 + 4*(a^2 + 2*b^2 - 2*a*c)*sin(4*x)*sin(2*x) + 4
*(a^2 + 2*b^2 - 2*a*c)*sin(2*x)^2 + a^2 + 2*b^2 - 2*a*c + 2*(a^2 + 2*b^2 -
2*a*c + 2*(a^2 + 2*b^2 - 2*a*c)*cos(2*x))*cos(4*x) + 4*(a^2 + 2*b^2 - 2*a*c
)*cos(2*x))*log(cos(x)^2 + sin(x)^2 - 2*sin(x) + 1) + 4*(a^2*cos(3*x) + 2*a
*b*cos(2*x) - a^2*cos(x) + 2*a*b)*sin(4*x) - 4*(2*a^2*cos(2*x) + a^2)*sin(3
*x) - 8*(a^2*cos(x) - a*b)*sin(2*x))/(a^3*cos(4*x)^2 + 4*a^3*cos(2*x)^2 + a
^3*sin(4*x)^2 + 4*a^3*sin(4*x)*sin(2*x) + 4*a^3*sin(2*x)^2 + 4*a^3*cos(2*x)
+ a^3 + 2*(2*a^3*cos(2*x) + a^3)*cos(4*x))

```

**mupad [B]** time = 14.82, size = 45255, normalized size = 135.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In]  $\text{int}(1/(\cos(x)^3*(a + b*\cos(x) + c*\cos(x)^2)),x)$

[Out]  $((\tan(x/2)^3*(a + 2*b))/a^2 + (\tan(x/2)*(a - 2*b))/a^2)/(\tan(x/2)^4 - 2*\tan(x/2)^2 + 1) - \text{atan}(\frac{(2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5 - 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2)}{a^8} - (2048*\tan(x/2)*((8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^{1/2} + b^8*c^2 - 10*a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^{1/2} + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^{1/2} + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^{1/2} + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^{1/2} - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^{1/2} + 6*a*b^5*c*(-(4*a*c - b^2)^3)^{1/2})/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^{1/2}*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 12$

$$\begin{aligned}
& 8a^{14}c^3 - 64a^{15}c^2 - 8a^{10}b^6c - 56a^{11}b^5c - 32a^{12}b^4c^2 + 1 \\
& 84a^{12}b^4c + 352a^{13}b^3c^3 - 200a^{13}b^3c^3 + 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^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^3 \\
& *b^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 * (-4ac \\
& *c - 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^2 \\
& *c + 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^8 \\
& *c^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^8 \\
& *b^6c + 375a^8b^6c + 496a^9b^5c - 416a^9b^5c - 16a^{10}b^4c + 29 \\
& 5a^{10}b^4c - 328a^{11}b^3c - 178a^{11}b^3c + 184a^{12}b^2c^2 + 84a^{12}b^2 \\
& *c + 8a^4b^8c^3 - 8a^4b^9c^2 - 72a^5b^6c^4 + 56a^5b^7c^3 + 11 \\
& 2a^5b^8c^2 + 220a^6b^4c^5 - 140a^6b^5c^4 - 424a^6b^6c^3 + 80a^6 \\
& b^7c^2 - 256a^7b^2c^6 + 192a^7b^3c^5 + 416a^7b^4c^4 + 572a^7b^5 \\
& *c^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 \\
& * ((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^3 \\
& *b^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 * (-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^8 \\
& *c^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 - 9 \\
& 6a^6b^7c - 238a^6b^7c - 200a^7b^6c + 154a^7b^6c + 100a^8b^5c^5 \\
& - 72a^8b^5c + 112a^9b^4c + 27a^9b^4c - 68a^{10}b^3c^3 - 6a^{10}b^3 \\
& *c + 8a^{11}b^2c^2 + 8a^2b^8c^4 - 20a^2b^9c^3 + 4a^2b^{10}c^2 - 60a^3 \\
& *b^6c^5 + 156a^3b^7c^4 + 2a^3b^8c^3 - 222a^3b^9c^2 + 136a^4b^4 \\
& *c^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 + 5 \\
& 83a^6b^4c^4 - 564a^6b^5c^3 - 655a^6b^6c^2 - 399a^7b^2c^5 + 9a^7 \\
& *b^3c^4 + 536a^7b^4c^3 + 612a^7b^5c^2 - 37a^8b^2c^4 - 524a^8b^3 \\
& *c^3 - 354a^8b^4c^2 + 239a^9b^2c^3 + 145a^9b^3c^2 - 47a^{10}b^2c
\end{aligned}$$

$$\begin{aligned}
& \left. \right)^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
\end{aligned}$$

$$\begin{aligned}
& ^{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 * ((8a^4c^6 - b^{10} + 8a^5c^5 - b^7 * (-4ac - b^2)^3)^{1/2} + b^8c^2 - 10 \\
& * a^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 * (-4ac - b^2)^3)^{1/2} + 12a^2b^8c - 4a^2b^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} + 6a^2b^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^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 * ((8a^4c^6 - b^{10} + 8a^5c^5 - b^7 * (-4ac - b^2)^3)^{1/2} + b^8c^2 - 10 \\
& * a^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 * (-4ac - b^2)^3)^{1/2} + 12a^2b^8c - 4a^2b^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} + 6a^2b^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^3
\end{aligned}$$



$$\begin{aligned}
& 2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4 \\
& *a*c - b^2)^3)^{(1/2)} + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + \\
& 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} \\
& - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 6*a*b^5*c*(-(4*a*c - b^2)^3)^{(1/2)} \\
& )/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^ \\
& 7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^{(1/ \\
& 2)}*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a \\
& ^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c \\
& ^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^ \\
& 13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^ \\
& 3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - \\
& 272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)* \\
& (8*a^4*c^6 - b^10 + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^{(1/2)} + b^8*c^2 - 10 \\
& *a*b^6*c^3 + 33*a^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4* \\
& c^3 - 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 12*a*b^8*c - 4*a* \\
& b^3*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} + 4 \\
& *a^3*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/ \\
& 2)} + 6*a*b^5*c*(-(4*a*c - b^2)^3)^{(1/2)))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 \\
& + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8* \\
& a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^{(1/2)} + (2048*tan(x/2)*(8*a^14*c + 8*a^4*b^ \\
& 11 - 24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a \\
& ^10*b^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 \\
& - 192*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - \\
& 72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c \\
& + 496*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^1 \\
& 1*b*c^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - \\
& 8*a^4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^ \\
& 6*b^4*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^ \\
& 2*c^6 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c \\
& ^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2 \\
& + 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 + \\
& 770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8)*((8*a^4*c^6 - b^10 \\
& + 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^{(1/2)} + b^8*c^2 - 10*a*b^6*c^3 + 33*a \\
& ^2*b^4*c^4 - 52*a^2*b^6*c^2 - 38*a^3*b^2*c^5 + 96*a^3*b^4*c^3 - 66*a^4*b^2* \\
& c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c \\
& - b^2)^3)^{(1/2)} + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a^3*b*c^3*(-(4*a \\
& *c - b^2)^3)^{(1/2)} - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 6*a*b^5*c*(- \\
& (4*a*c - b^2)^3)^{(1/2)))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 1 \\
& 6*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32* \\
& a^8*b^2*c^2)))^{(1/2)} - (2048*(26*a^3*b^11 - 12*a^2*b^12 - 30*a^4*b^10 + 29* \\
& a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a \\
& ^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^10*c^4 + 12*a^11*c^3 + 20*a^2*b^11* \\
& c + 98*a^3*b^10*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b*c^7 - 238*a^6* \\
& b^7*c - 200*a^7*b*c^6 + 154*a^7*b^6*c + 100*a^8*b*c^5 - 72*a^8*b^5*c + 112* \\
& a^9*b*c^4 + 27*a^9*b^4*c - 68*a^10*b*c^3 - 6*a^10*b^3*c + 8*a^11*b*c^2 + 8*
\end{aligned}$$



$$\begin{aligned}
& a^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 + 63 \\
& 5a^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 * ((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^2c^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 + 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 * ((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^2c^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^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) * ((8a^4c^6 - b^{10} + 8a^5c^5 \\
& - b^7 * (- (4ac - b^2)^3)^{(1/2)}
\end{aligned}$$

$$\begin{aligned}
& + 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 \\
& 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 - 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^2 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 - 178 a^{11} b^3 c + 184 a^{12} b^2 c + 84 a^{12} b^2 c + 8 a^4 b^8 c^3 - 8 a^4 b^9 c^2 - 72 a^5 b^6 c^4 + 56 a^5 b^7 c^3 + 112 a^5 b^8 c^2 + 220 a^6 b^4 c^5 - 140 a^6 b^5 c^4 - 424 a^6 b^6 c^3 + 80 a^6 b^7 c^2 - 256 a^7 b^2 c^6 + 192 a^7 b^3 c^5 + 416 a^7 b^4 c^4 + 572 a^7 b^5 c^3 - 732 a^7 b^6 c^2 + 64 a^8 b^2 c^5 - 115 2 a^8 b^3 c^4 + 521 a^8 b^4 c^3 + 779 a^8 b^5 c^2 + 234 a^9 b^2 c^4 - 494 a^9 b^3 c^3 - 723 a^9 b^4 c^2 + 180 a^{10} b^2 c^3 + 770 a^{10} b^3 c^2 - 416 a^{11} b^2 c^2 - 24 a^{13} b^2 c) / a^8 * ((8 a^4 c^6 - b^{10} + 8 a^5 c^5 - b^7 (-4 a c - b^2)^3)^{1/2} + b^8 c^2 - 10 a b^6 c^3 + 33 a^2 b^4 c^4 - 52 a^2 b^6 c^2 - 38 a^3 b^2 c^5 + 96 a^3 b^4 c^3 - 66 a^4 b^2 c^4 + b^5 c^2 (-4 a c - b^2)^3)^{1/2} + 12 a b^8 c - 4 a b^3 c^3 (-4 a c - b^2)^3)^{1/2} + 3 a^2 b c^4 (-4 a c - b^2)^3)^{1/2} + 4 a^3 b c^3 (-4 a c - b^2)^3)^{1/2} - 10 a^2 b^3 c^2 (-4 a c - b^2)^3)^{1/2} + 6 a b^5 c (-4 a c - b^2)^3)^{1/2} / (2 (a^8 b^4 - a^6 b^6 + 16 a^8 c^4 + 32 a^9 c^3 + 16 a^{10} c^2 + 10 a^7 b^4 c - 8 a^9 b^2 c + a^6 b^4 c^2 - 8 a^7 b^2 c^3 - 32 a^8 b^2 c^2))^{1/2} - (2048 * (26 a^3 b^{11} - 12 a^2 b^{12} - 30 a^4 b^{10} + 29 a^5 b^9 - 20 a^6 b^8 + 10 a^7 b^7 - 4 a^8 b^6 + a^9 b^5 + 12 a^6 c^8 + 88 a^7 c^7 + 72 a^8 c^6 - 44 a^9 c^5 - 28 a^{10} c^4 + 12 a^{11} c^3 + 20 a^2 b^{11} c + 98 a^3 b^{10} c - 228 a^4 b^9 c + 251 a^5 b^8 c - 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
\end{aligned}$$

$$\begin{aligned}
& - 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 - 22a^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)*((8a^4c^6 - b^{10} + 8a^5c^5 - b^7c^2 - (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^2c^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)*(4a^12b + 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)*((8a^4c^6 - b^{10} + 8a^5c^5 - b^7c^2 - (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^2c^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})*((8a^4c^6 - b^{10} + 8a^5c^5 - b^7c^2 - (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^2c^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}*2i - \operatorname{atan}(((
\end{aligned}$$

$$\begin{aligned}
& (((((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^1 \\
& 13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 \\
& + 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 4 \\
& 96*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 2 \\
& 04*a^12*b^2*c^2))/a^8 - (2048*\tan(x/2)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^ \\
& 7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a \\
& ^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-( \\
& 4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + \\
& 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2 \\
& ) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^(1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^( \\
& (1/2)))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a \\
& ^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1 \\
& /2)*(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24* \\
& a^14*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15* \\
& c^2 - 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a \\
& ^13*b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c \\
& ^3 - 8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - \\
& 272*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)* \\
& (-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + \\
& 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^ \\
& 4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4* \\
& a*b^3*c^3*(-(4*a*c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + \\
& 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^(1/2) - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^( \\
& 1/2) + 6*a*b^5*c*(-(4*a*c - b^2)^3)^(1/2))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c \\
& ^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - \\
& 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2)))^(1/2) + (2048*\tan(x/2)*(8*a^14*c + 8*a^4* \\
& b^11 - 24*a^5*b^10 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33 \\
& *a^10*b^5 - 17*a^11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 \\
& - 192*a^10*c^5 + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c \\
& - 72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6 \\
& *c + 496*a^9*b*c^5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a \\
& ^11*b*c^3 - 178*a^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 \\
& - 8*a^4*b^9*c^2 - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220* \\
& a^6*b^4*c^5 - 140*a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7* \\
& b^2*c^6 + 192*a^7*b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6 \\
& *c^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^ \\
& 2 + 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 \\
& + 770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8)*(-(b^10 - 8*a^4* \\
& c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^(1/2) - b^8*c^2 + 10*a*b^6*c^3 - 3 \\
& 3*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b \\
& ^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^(1/2) - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a \\
& *c - b^2)^3)^(1/2) + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^(1/2) + 4*a^3*b*c^3*(-(
\end{aligned}$$

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

$$\begin{aligned}
& (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 + 17 \\
& 6*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32*a^14*c^2 + 20*a^8*b^7*c + 74*a \\
& ^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c - 352*a^11*b*c^4 + 122*a^11*b^4* \\
& c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13*b*c^2 + 16*a^13*b^2*c + 8*a^8* \\
& b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 44*a^9*b^2*c^5 + 116*a^9*b^3*c^4 \\
& + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^10*b^2*c^4 + 496*a^10*b^3*c^3 - \\
& 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^11*b^3*c^2 - 204*a^12*b^2*c^2)) \\
& /a^8 + (2048*\tan(x/2)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2) \\
& ^3)^{(1/2)} - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a \\
& ^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^{( \\
& 1/2)} - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^{(1/2)} + 3*a^2*b*c^4*(-(4 \\
& *a*c - b^2)^3)^{(1/2)} + 4*a^3*b*c^3*(-(4*a*c - b^2)^3)^{(1/2)} - 10*a^2*b^3*c^ \\
& 2*(-(4*a*c - b^2)^3)^{(1/2)} + 6*a*b^5*c*(-(4*a*c - b^2)^3)^{(1/2)))/(2*(a^8*b^ \\
& 4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9* \\
& b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 32*a^8*b^2*c^2))^{(1/2)}*(32*a^16*c + \\
& 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14*b^3 - 8*a^15 \\
& *b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2 - 8*a^10*b^6* \\
& c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*b*c^3 - 200*a \\
& ^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 - 8*a^10*b^5*c \\
& ^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272*a^12*b^2*c^3 \\
& + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^8)*(-(b^10 - 8*a^4*c \\
& ^6 - 8*a^5*c^5 - b^7*(-(4*a*c - b^2)^3)^{(1/2)} - b^8*c^2 + 10*a*b^6*c^3 - 33 \\
& *a^2*b^4*c^4 + 52*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^ \\
& 2*c^4 + b^5*c^2*(-(4*a*c - b^2)^3)^{(1/2)} - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a* \\
& c - b^2)^3)^{(1/2)} + 3*a^2*b*c^4*(-(4*a*c - b^2)^3)^{(1/2)} + 4*a^3*b*c^3*(-(4 \\
& *a*c - b^2)^3)^{(1/2)} - 10*a^2*b^3*c^2*(-(4*a*c - b^2)^3)^{(1/2)} + 6*a*b^5*c* \\
& (-(4*a*c - b^2)^3)^{(1/2)))/(2*(a^8*b^4 - a^6*b^6 + 16*a^8*c^4 + 32*a^9*c^3 + \\
& 16*a^10*c^2 + 10*a^7*b^4*c - 8*a^9*b^2*c + a^6*b^4*c^2 - 8*a^7*b^2*c^3 - 3 \\
& 2*a^8*b^2*c^2))^{(1/2)} - (2048*\tan(x/2)*(8*a^14*c + 8*a^4*b^11 - 24*a^5*b^1 \\
& 0 + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^10*b^5 - 17*a^ \\
& 11*b^4 + 6*a^12*b^3 - 2*a^13*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192*a^10*c^5 \\
& + 168*a^11*c^4 + 80*a^12*c^3 - 64*a^13*c^2 - 8*a^4*b^10*c - 72*a^5*b^9*c + \\
& 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b*c^6 + 375*a^8*b^6*c + 496*a^9*b*c^ \\
& 5 - 416*a^9*b^5*c - 16*a^10*b*c^4 + 295*a^10*b^4*c - 328*a^11*b*c^3 - 178*a \\
& ^11*b^3*c + 184*a^12*b*c^2 + 84*a^12*b^2*c + 8*a^4*b^8*c^3 - 8*a^4*b^9*c^2 \\
& - 72*a^5*b^6*c^4 + 56*a^5*b^7*c^3 + 112*a^5*b^8*c^2 + 220*a^6*b^4*c^5 - 140 \\
& *a^6*b^5*c^4 - 424*a^6*b^6*c^3 + 80*a^6*b^7*c^2 - 256*a^7*b^2*c^6 + 192*a^7 \\
& *b^3*c^5 + 416*a^7*b^4*c^4 + 572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2 \\
& *c^5 - 1152*a^8*b^3*c^4 + 521*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c \\
& ^4 - 494*a^9*b^3*c^3 - 723*a^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^ \\
& 2 - 416*a^11*b^2*c^2 - 24*a^13*b*c))/a^8)*(-(b^10 - 8*a^4*c^6 - 8*a^5*c^5 - \\
& b^7*(-(4*a*c - b^2)^3)^{(1/2)} - b^8*c^2 + 10*a*b^6*c^3 - 33*a^2*b^4*c^4 + 5 \\
& 2*a^2*b^6*c^2 + 38*a^3*b^2*c^5 - 96*a^3*b^4*c^3 + 66*a^4*b^2*c^4 + b^5*c^2* \\
& (-(4*a*c - b^2)^3)^{(1/2)} - 12*a*b^8*c - 4*a*b^3*c^3*(-(4*a*c - b^2)^3)^{(1/2)}
\end{aligned}$$

$$\begin{aligned}
& ) + 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^3(-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^2 \\
& + 154a^7b^6c + 100a^8b^5c^2 - 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 + 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^3(-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^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) * (-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^3(-4ac - b^2)^3)^{(1/2)} \\
& ) / (2(a^8b^4 - a^6b^6 + 16a^8c^4 +
\end{aligned}$$

$$\begin{aligned}
& (32a^9c^3 + 16a^{10}c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7 \\
& *b^2c^3 - 32a^8b^2c^2))^{\frac{1}{2}} * i) / ((4096 * (14a^3c^9 + a^4c^8 - 10a^5 \\
& c^7 + 3a^6c^6 - 4b^4c^8 + 16b^5c^7 - 24b^6c^6 + 16b^7c^5 - 4b^8 \\
& c^4 + 4a^2b^2c^9 - 28a^3b^3c^8 + 56a^4b^4c^7 - 40a^5b^5c^6 + 4a^6b^6 \\
& c^5 + 4a^7b^7c^4 + 12a^2b^2c^9 - 22a^3b^3c^8 + 4a^4b^4c^7 + 6a^5b^5c^6 \\
& - 2a^6b^6c^5 - 48a^2b^2c^8 + 48a^2b^3c^7 - 8a^2b^4c^6 - 4a^2b^6 \\
& c^4 + 4a^3b^2c^7 - 4a^3b^3c^6 + 4a^3b^5c^4 + 10a^4b^2c^6 - 8a^4 \\
& b^3c^5 - a^4b^4c^4 - a^5b^2c^5 + a^5b^3c^4)) / a^8 + (((((2048 * (26 \\
& a^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^4 + 122a^{11} \\
& b^4c - 144a^{12}b^3c^3 - 40a^{12}b^3c^3 + 64a^{13}b^2c^2 + 16a^{13}b^2c + 8 \\
& a^8b^4c^4 - 20a^8b^5c^3 + 4a^8b^6c^2 - 44a^9b^2c^5 + 116a^9b^3 \\
& c^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 * (- (4a^4c - \\
& b^2)^3)^{\frac{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^4c - b^2)^3)^{\frac{1}{2}} - 12a^2b^8c - 4a^2b^3c^3 * (- (4a^4c - b^2)^3)^{\frac{1}{2}} + 3a^2b^2c^4 \\
& * (- (4a^4c - b^2)^3)^{\frac{1}{2}} + 4a^3b^2c^3 * (- (4a^4c - b^2)^3)^{\frac{1}{2}} - 10a^2b^3 \\
& c^2 * (- (4a^4c - b^2)^3)^{\frac{1}{2}} + 6a^2b^5c * (- (4a^4c - b^2)^3)^{\frac{1}{2}})) / (2 * (a^8 \\
& b^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))^{\frac{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 - 8 \\
& a^{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^2 \\
& c^3 + 8a^{12}b^3c^2 - 320a^{13}b^2c^2 - 96a^{15}b^2c)) / a^8 * (- (b^{10} - 8a^4 \\
& c^6 - 8a^5c^5 - b^7 * (- (4a^4c - b^2)^3)^{\frac{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^4 \\
& b^2c^4 + b^5c^2 * (- (4a^4c - b^2)^3)^{\frac{1}{2}} - 12a^2b^8c - 4a^2b^3c^3 * (- \\
& (4a^4c - b^2)^3)^{\frac{1}{2}} + 3a^2b^2c^4 * (- (4a^4c - b^2)^3)^{\frac{1}{2}} + 4a^3b^2c^3 \\
& * (- (4a^4c - b^2)^3)^{\frac{1}{2}} - 10a^2b^3c^2 * (- (4a^4c - b^2)^3)^{\frac{1}{2}} + 6a^2b^5 \\
& c * (- (4a^4c - b^2)^3)^{\frac{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))^{\frac{1}{2}} + (2048 * \tan(x/2) * (8a^{14}c + 8a^4b^{11} - 24a^5 \\
& b^{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^9 \\
& c + 244a^6b^8c - 308a^7b^7c - 88a^8b^6c^6 + 375a^8b^6c + 496a^9 \\
& b^5c^5 - 416a^9b^5c - 16a^{10}b^4c^4 + 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^9 \\
& c^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
\end{aligned}$$



$$\begin{aligned}
& 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^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 * (- (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 + 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 * (- (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 * (- (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 + 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^5
\end{aligned}$$

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

$$\begin{aligned}
& 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^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 * (- (4ac - b^2)^3)^{1/2} + 4a^3b^2c^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^2 + 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^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) * (- (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 * (- (4ac - b^2)^3)^{1/2} + 4a^3b^2c^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 - 132a^6b^3c^4 + 174a^6b^3c^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 + 24a^8b^{11}c)) / a^8 * (- (b^{10} - 8a^4c^6 \\
& - 8a^5c^5 - b^7 * (- (4ac - b^2)^3)^{1/2} - b^8c^2 + 10a^6c^3 - 33a^ \\
& 2b^4c^4 + 52a^2b^6c^2 + 38a^3b^2c^5 - 96a^3b^4c^3 + 66a^4b^2c^4 \\
& ^4 + b^5c^2 * (- (4ac - b^2)^3)^{1/2} - 12a^8c - 4a^6b^3c^3 * (- (4ac - \\
& b^2)^3)^{1/2} + 3a^2b^4c^4 * (- (4ac - b^2)^3)^{1/2} + 4a^3b^3c^3 * (- (4ac \\
& c - b^2)^3)^{1/2} - 10a^2b^3c^2 * (- (4ac - b^2)^3)^{1/2} + 6a^5b^5c * (- ( \\
& 4ac - b^2)^3)^{1/2} ) / (2 * (a^8b^4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16 \\
& a^10c^2 + 10a^7b^4c - 8a^9b^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^ \\
& ^8b^2c^2))^{1/2} ) * (- (b^{10} - 8a^4c^6 - 8a^5c^5 - b^7 * (- (4ac - b^2) \\
& ^3)^{1/2} - b^8c^2 + 10a^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} \\
& 1/2 - 12a^8c - 4a^6b^3c^3 * (- (4ac - b^2)^3)^{1/2} + 3a^2b^4c^4 * (- (4 \\
& ac - 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} + 6a^5b^5c * (- (4ac - b^2)^3)^{1/2} ) / (2 * (a^8b^ \\
& 4 - a^6b^6 + 16a^8c^4 + 32a^9c^3 + 16a^10c^2 + 10a^7b^4c - 8a^9b^ \\
& ^2c + a^6b^4c^2 - 8a^7b^2c^3 - 32a^8b^2c^2))^{1/2} * 2i + (\operatorname{atan}((( \\
& ((2048 * \tan(x/2) * (4a^8b^{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 - 2 \\
& 4a^6b^6c^6 + 136a^7b^7c^5 - 300a^8b^8c^4 + 320a^9b^9c^3 - 160a^10b^{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^5c^4 \\
& + 44a^2b^4c^7 - 300a^2b^5c^6 + 764a^2b^6c^5 - 900a^2b^7c^4 + 4 \\
& 60a^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^8 \\
& *c^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 + 41 \\
& a^5b^4c^4 - 132a^5b^5c^3 + 82a^5b^6c^2 - 90a^6b^2c^5 + 174a^6b^3c^4 \\
& ^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^8b^{11}c)) / a^8 + (((2048 * (26a^3b^1 \\
& 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^ \\
& 10c^4 + 12a^{11}c^3 + 20a^2b^{11}c + 98a^3b^{10}c - 228a^4b^9c + 251 \\
& a^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^3 \\
& - 6a^{10}b^3c + 8a^{11}b^2c^2 + 8a^2b^8c^4 - 20a^2b^9c^3 + 4a^2b^{1 \\
& 0}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 - 2 \\
& 02a^4b^8c^2 - 100a^5b^2c^7 + 364a^5b^3c^6 + 394a^5b^4c^5 - 1362 \\
& a^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^
\end{aligned}$$



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

$$\begin{aligned}
& 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^7 + 4a^5b^7c + 2a^6b^6c^6 - 8 \\
& a^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 - 3 \\
& 2a^3b^2c^8 + 272a^3b^3c^7 - 840a^3b^4c^6 + 1156a^3b^5c^5 - 660a \\
& 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 + 82a \\
& 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 + \\
& 24ab^{11}c)/a^8 + (((2048*(26a^3b^{11} - 12a^2b^{12} - 30a^4b^{10} + 29a \\
& a^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 \\
& b^7c - 200a^7b^6c + 154a^7b^6c + 100a^8b^5c - 72a^8b^5c + 112a \\
& a^9b^4c + 27a^9b^4c - 68a^{10}b^3c - 6a^{10}b^3c + 8a^{11}b^2c + 8a \\
& a^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 + 63 \\
& 5a^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 \\
& a^{13}c^2 - 8a^4b^{10}c - 72a^5b^9c + 244a^6b^8c - 308a^7b^7c - 88 \\
& a^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^ \\
& 12b^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 + 8 \\
& 0a^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 \\
& b^4c^3 + 779a^8b^5c^2 + 234a^9b^2c^4 - 494a^9b^3c^3 - 723a^9b^4 \\
& c^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^ \\
& 12b^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 \\
& ^11b^4c + 122a^{11}b^4c - 144a^{12}b^3c - 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 \\
& b^2c^5 + 116a^9b^3c^4 + 10a^9b^4c^3 - 182a^9b^5c^2 - 148a^{10}b^2 \\
& c^4 + 496a^{10}b^3c^3 - 50a^{10}b^4c^2 - 260a^{11}b^2c^3 + 388a^{11}b^3
\end{aligned}$$

$$\begin{aligned}
& *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^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^3*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) + (((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^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^6 - 8*a^6*b^6*c - 84*a^7*b^6*c^5 + 26*a^8*b^6*c^4 + 44*a^2*b^4*c^7 - 300*a^2*b^5*c^6 + 764*a^2*b^6*c^5 - 900*a^2*b^7*c^4 + 460*a^2*b^8*c^3 - 44*a^2*b^9*c^2 - 32*a^3*b^2*c^8 + 272*a^3*b^3*c^7 - 840*a^3*b^4*c^6 + 1156*a^3*b^5*c^5 - 660*a^3*b^6*c^4 + 72*a^3*b^7*c^3 + 8*a^3*b^8*c^2 + 384*a^4*b^2*c^7 - 704*a^4*b^3*c^6 + 541*a^4*b^4*c^5 - 149*a^4*b^5*c^4 + 34*a^4*b^6*c^3 + 6*a^4*b^7*c^2 - 204*a^5*b^2*c^6 + 96*a^5*b^3*c^5 + 41*a^5*b^4*c^4 - 132*a^5*b^5*c^3 + 82*a^5*b^6*c^2 - 90*a^6*b^2*c^5 + 174*a^6*b^3*c^4 - 104*a^6*b^4*c^3 + 8*a^6*b^5*c^2 + 82*a^7*b^2*c^4 - 40*a^7*b^3*c^3 + 20*a^7*b^4*c^2 - 16*a^8*b^2*c^3 + 24*a*b^{11}*c))/a^8 - (((2048*(26*a^3*b^{11} - 12*a^2*b^{12} - 30*a^4*b^{10} + 29*a^5*b^9 - 20*a^6*b^8 + 10*a^7*b^7 - 4*a^8*b^6 + a^9*b^5 + 12*a^6*c^8 + 88*a^7*c^7 + 72*a^8*c^6 - 44*a^9*c^5 - 28*a^{10}*c^4 + 12*a^{11}*c^3 + 20*a^2*b^{11}*c + 98*a^3*b^{10}*c - 228*a^4*b^9*c + 251*a^5*b^8*c - 96*a^6*b^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^2 + 8*a^2*b^8*c^4 - 20*a^2*b^9*c^3 + 4*a^2*b^{10}*c^2 - 60*a^3*b^6*c^5 + 156*a^3*b^7*c^4 + 2*a^3*b^8*c^3 - 222*a^3*b^9*c^2 + 136*a^4*b^4*c^6 - 388*a^4*b^5*c^5 - 152*a^4*b^6*c^4 + 856*a^4*b^7*c^3 - 202*a^4*b^8*c^2 - 100*a^5*b^2*c^7 + 364*a^5*b^3*c^6 + 394*a^5*b^4*c^5 - 1362*a^5*b^5*c^4 - 115*a^5*b^6*c^3 + 635*a^5*b^7*c^2 - 340*a^6*b^2*c^6 + 904*a^6*b^3*c^5 + 583*a^6*b^4*c^4 - 564*a^6*b^5*c^3 - 655*a^6*b^6*c^2 - 399*a^7*b^2*c^5 + 9*a^7*b^3*c^4 + 536*a^7*b^4*c^3 + 612*a^7*b^5*c^2 - 37*a^8*b^2*c^4 - 524*a^8*b^3*c^3 - 354*a^8*b^4*c^2 + 239*a^9*b^2*c^3 + 145*a^9*b^3*c^2 - 47*a^{10}*b^2*c^2))/a^8 + (((2048*\tan(x/2)*(8*a^{14}*c + 8*a^4*b^{11} - 24*a^5*b^{10} + 36*a^6*b^9 - 52*a^7*b^8 + 61*a^8*b^7 - 49*a^9*b^6 + 33*a^{10}*b^5 - 17*a^{11}*b^4 + 6*a^{12}*b^3 - 2*a^{13}*b^2 + 72*a^8*c^7 - 136*a^9*c^6 - 192*a^{10}*c^5 + 168*a^{11}*c^4 + 80*a^{12}*c^3 - 64*a^{13}*c^2 - 8*a^4*b^{10}*c - 72*a^5*b^9*c + 244*a^6*b^8*c - 308*a^7*b^7*c - 88*a^8*b^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 - 178*a^{11}*b^3*c + 184*a^{12}*b^2*c + 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 +
\end{aligned}$$



```

572*a^7*b^5*c^3 - 732*a^7*b^6*c^2 + 64*a^8*b^2*c^5 - 1152*a^8*b^3*c^4 + 52
1*a^8*b^4*c^3 + 779*a^8*b^5*c^2 + 234*a^9*b^2*c^4 - 494*a^9*b^3*c^3 - 723*a
^9*b^4*c^2 + 180*a^10*b^2*c^3 + 770*a^10*b^3*c^2 - 416*a^11*b^2*c^2 - 24*a^
13*b*c))/a^8 - (((2048*(26*a^9*b^7 - 12*a^8*b^8 - 18*a^10*b^6 + 6*a^11*b^5
- 2*a^12*b^4 + 48*a^10*c^6 + 176*a^11*c^5 + 176*a^12*c^4 + 16*a^13*c^3 - 32
*a^14*c^2 + 20*a^8*b^7*c + 74*a^9*b^6*c - 144*a^10*b*c^5 - 192*a^10*b^5*c -
352*a^11*b*c^4 + 122*a^11*b^4*c - 144*a^12*b*c^3 - 40*a^12*b^3*c + 64*a^13
*b*c^2 + 16*a^13*b^2*c + 8*a^8*b^4*c^4 - 20*a^8*b^5*c^3 + 4*a^8*b^6*c^2 - 4
4*a^9*b^2*c^5 + 116*a^9*b^3*c^4 + 10*a^9*b^4*c^3 - 182*a^9*b^5*c^2 - 148*a^
10*b^2*c^4 + 496*a^10*b^3*c^3 - 50*a^10*b^4*c^2 - 260*a^11*b^2*c^3 + 388*a^
11*b^3*c^2 - 204*a^12*b^2*c^2))/a^8 + (1024*tan(x/2)*(a^2 - 2*a*c + 2*b^2)*
(32*a^16*c + 8*a^10*b^7 - 24*a^11*b^6 + 32*a^12*b^5 - 32*a^13*b^4 + 24*a^14
*b^3 - 8*a^15*b^2 + 96*a^12*c^5 + 64*a^13*c^4 - 128*a^14*c^3 - 64*a^15*c^2
- 8*a^10*b^6*c - 56*a^11*b^5*c - 32*a^12*b*c^4 + 184*a^12*b^4*c + 352*a^13*
b*c^3 - 200*a^13*b^3*c + 288*a^14*b*c^2 + 144*a^14*b^2*c + 8*a^10*b^4*c^3 -
8*a^10*b^5*c^2 - 56*a^11*b^2*c^4 + 40*a^11*b^3*c^3 + 96*a^11*b^4*c^2 - 272
*a^12*b^2*c^3 + 8*a^12*b^3*c^2 - 320*a^13*b^2*c^2 - 96*a^15*b*c))/a^11)*(a^
2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c +
2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2))/(2*a^3))*(a^2 - 2*a*c + 2*b^2)*1i
)/a^3

```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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



# Chapter 4

## Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

### 4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)

(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*      GradeAntiderivative[result,optimal] returns*)
(* "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(* "C" if result involves higher level functions than necessary*)
(* "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(* "A" if result can be considered optimal*)

GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
```

```

If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
  If[LeafCount[result]<=2*LeafCount[optimal],
    "A",
    "B"],
  "C"],
If[FreeQ[result,Integrate] && FreeQ[result,Int],
  "C",
"F"]]

```

```
(* ::Text:: *)
```

```
(*The following summarizes the type number assigned an *)
```

```
(*expression based on the functions it involves*)
```

```
(*1 = rational function*)
```

```
(*2 = algebraic function*)
```

```
(*3 = elementary function*)
```

```
(*4 = special function*)
```

```
(*5 = hyperpergeometric function*)
```

```
(*6 = appell function*)
```

```
(*7 = rootsum function*)
```

```
(*8 = integrate function*)
```

```
(*9 = unknown function*)
```

```
ExpnType[expn_] :=
```

```
  If[AtomQ[expn],
```

```
    1,
```

```
  If[ListQ[expn],
```

```
    Max[Map[ExpnType,expn]],
```

```
  If[Head[expn]===Power,
```

```
    If[IntegerQ[expn[[2]],
```

```
      ExpnType[expn[[1]],
```

```
    If[Head[expn[[2]]]===Rational,
```

```
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
```

```
        1,
```

```
        Max[ExpnType[expn[[1]],2]],
```

```
      Max[ExpnType[expn[[1]],ExpnType[expn[[2]],3]],
```

```
  If[Head[expn]===Plus || Head[expn]===Times,
```

```
    Max[ExpnType[First[expn],ExpnType[Rest[expn]]],
```

```
  If[ElementaryFunctionQ[Head[expn]],
```

```
    Max[3,ExpnType[expn[[1]]],
```

```
  If[SpecialFunctionQ[Head[expn]],
```

```
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
```

```
  If[HypergeometricFunctionQ[Head[expn]],
```

```
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
```

```
  If[AppellFunctionQ[Head[expn]],
```

```
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
```

```

If[Head[expn]===RootSum,
  Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
If[Head[expn]===Integrate || Head[expn]===Int,
  Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
9]]]]]]]]]]

ElementaryFunctionQ[func_] :=
MemberQ[{
  Exp,Log,
  Sin,Cos,Tan,Cot,Sec,Csc,
  ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
  Sinh,Cosh,Tanh,Coth,Sech,Csch,
  ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]

SpecialFunctionQ[func_] :=
MemberQ[{
  Erf, Erfc, Erfi,
  FresnelS, FresnelC,
  ExpIntegralE, ExpIntegralEi, LogIntegral,
  SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
  Gamma, LogGamma, PolyGamma,
  Zeta, PolyLog, ProductLog,
  EllipticF, EllipticE, EllipticPi
},func]

HypergeometricFunctionQ[func_] :=
MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]

AppellFunctionQ[func_] :=
MemberQ[{AppellF1},func]

```

## 4.0.2 Maple grading function

```

# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017 Use Maple leaf count instead since buildin
#Nasser 03/23/2017 missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017 corrected the check for complex result
#Nasser 10/27/2017 check for leafsize and do not call ExpnType()
#
# if leaf size is "too large". Set at 500,000

```

```

#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                      see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
    debug:=false;

    leaf_count_result:=leafcount(result);
    #do NOT call ExpnType() if leaf size is too large. Recursion problem
    if leaf_count_result > 500000 then
        return "B";
    fi;

    leaf_count_optimal:=leafcount(optimal);

    ExpnType_result:=ExpnType(result);
    ExpnType_optimal:=ExpnType(optimal);

    if debug then
        print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
ExpnType_optimal);
    fi;

# If result and optimal are mathematical expressions,
# GradeAntiderivative[result,optimal] returns
# "F" if the result fails to integrate an expression that
#   is integrable
# "C" if result involves higher level functions than necessary
# "B" if result is more than twice the size of the optimal
#   antiderivative
# "A" if result can be considered optimal

#This check below actually is not needed, since I only
#call this grading only for passed integrals. i.e. I check
#for "F" before calling this. But no harm of keeping it here.
#just in case.

if not type(result,freeof('int')) then
    return "F";
end if;

if ExpnType_result<=ExpnType_optimal then
    if debug then
        print("ExpnType_result<=ExpnType_optimal");
    fi;

```

```

if is_contains_complex(result) then
  if is_contains_complex(optimal) then
    if debug then
      print("both result and optimal complex");
    fi;
    #both result and optimal complex
    if leaf_count_result<=2*leaf_count_optimal then
      return "A";
    else
      return "B";
    end if
  else #result contains complex but optimal is not
    if debug then
      print("result contains complex but optimal is not");
    fi;
    return "C";
  end if
else # result do not contain complex
  # this assumes optimal do not as well
  if debug then
    print("result do not contain complex, this assumes optimal do not
as well");
  fi;
  if leaf_count_result<=2*leaf_count_optimal then
    if debug then
      print("leaf_count_result<=2*leaf_count_optimal");
    fi;
    return "A";
  else
    if debug then
      print("leaf_count_result>2*leaf_count_optimal");
    fi;
    return "B";
  end if
end if
else #ExpnType(result) > ExpnType(optimal)
  if debug then
    print("ExpnType(result) > ExpnType(optimal)");
  fi;
  return "C";
end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false

```

```

#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
      1
    else
      max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'^^') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
        1
      else
        max(2,ExpnType(op(1,expn)))
      end if
    else
      max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  end if
end proc:

```



```

elif HypergeometricFunctionQ(op(0,expn)) then
  max(5,apply(max,map(ExpnType,[op(expn)])))
elif AppellFunctionQ(op(0,expn)) then
  max(6,apply(max,map(ExpnType,[op(expn)])))
elif op(0,expn)='int' then
  max(8,apply(max,map(ExpnType,[op(expn)]))) else
9
end if
end proc:

ElementaryFunctionQ := proc(func)
  member(func,[
    exp,log,ln,
    sin,cos,tan,cot,sec,csc,
    arcsin,arccos,arctan,arccot,arcsec,arccsc,
    sinh,cosh,tanh,coth,sech,csch,
    arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
    erf,erfc,erfi,
    FresnelS,FresnelC,
    Ei,Ei,Li,Si,Ci,Shi,Chi,
    GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
    EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product. rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
    op(2,u)
  else
    apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

```

```
#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17 Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
  MmaTranslator[Mma][LeafCount](u);
end proc:
```

### 4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#           Port of original Maple grading function by
#           Albert Rich to use with Sympy/Python
#Dec 27, 2019 Nasser. Added `RootSum`. See problem 177, Timofeev file
#           added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
        asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
        asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
        fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
        gamma,loggamma,digamma,zeta,polylog,LambertW,
        elliptic_f,elliptic_e,elliptic_pi,exp_polar
        ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]
```

```

def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
            return True
        else:
            return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
        return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn)) #apply(max,map(ExpnType,expn))
    elif is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0])) #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow): #type(expn,'`^`')
        if isinstance(expn.args[1],Integer): #type(op(2,expn),'integer')
            return expnType(expn.args[0]) #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational): #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0])) #max(2,ExpnType(op(1,expn)
    ))
    else:
        return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
    ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type
    (expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2) #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func): #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0])) #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1) #max(4,apply(max,map(ExpnType,[op(expn)])))

```

```

elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
expn))
    m1 = max(map(expnType, list(expn.args)))
    return max(5,m1) #max(5,apply(max,map(ExpnType,[op(expn)])))
elif is_appell_function(expn.func):
    m1 = max(map(expnType, list(expn.args)))
    return max(6,m1) #max(5,apply(max,map(ExpnType,[op(expn)])))
elif isinstance(expn,RootSum):
    m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,
Apply[List,expn]],7]],
    return max(7,m1)
elif str(expn).find("Integral") != -1:
    m1 = max(map(expnType, list(expn.args)))
    return max(8,m1) #max(5,apply(max,map(ExpnType,[op(expn)])))
else:
    return 9

#main function
def grade_antiderivative(result,optimal):

    leaf_count_result = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"

```

## 4.0.4 SageMath grading function

```

#Dec 24, 2019. Nasser: Ported original Maple grading function by
#           Albert Rich to use with Sagemath. This is used to
#           grade Fracas, 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"
```